DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

NINETY-SEVENTH CONGRESS

SECOND SESSION

Part 4—Pages 1–683

Alternate Fighter Engine
DOD Shuttle Support
Fiscal Year 1983 Budget Statements
Space-based Laser Program
Tactical Aircraft Issues

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

TUESDAY, MAY 25, 1982

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room 1114, Everett McKinley Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present, Senators Stevens, Weicker, Schmitt, Andrews, Kasten, Rudman, and Chiles.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

STATEMENT OF LT. GEN. KELLY H. BURKE, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT AND ACQUISITION, U.S. AIR FORCE

ACCOMPANIED BY:

- **MAJ. GEN. ROBERT D. RUSS, DIRECTOR OF OPERATIONAL REQUIREMENTS, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT AND ACQUISITION**
- **MAJ. GEN. JAMES H. MARSHALL, DIRECTOR OF DEVELOPMENT AND PRODUCTION, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT AND ACQUISITION**

ALTERNATE FIGHTER ENGINE

OPENING STATEMENT OF SENATOR STEVENS

Senator STEVENS. Good morning. We are here to review the alternate fighter engine program and other related Air Force activities involved in the development of competing jet engines for use in tactical fighter aircraft.

We will hear first from the Air Force in support of its budgeted program for these engines, and then we will take testimony from outside witnesses representing first General Electric Corp. and then Pratt & Whitney Aircraft, the two principal jet aircraft engine manufacturers in the United States.

Congress took the lead in fostering more active competition in this area by funding development of General Electric's derivative fighter engine. That program has been successful, perhaps so successful that the competitive balance is in danger of tilting away from Pratt & Whitney's longer established F-100 engine.

The committee's interest is in assuring continued fair competition, not only to encourage a better product at a better price, but to guarantee a stable and dependable industry to support our military aircraft programs. Today we will examine Air Force policies in this program area and attempt to determine whether these policies will indeed support continued fair competition and the production of improved engines that can reasonably vie for military procurement dollars.

We also want to assure ourselves that present programs are designed to foster the development of a new generation of fighter engines in the same spirit of competition.

Our first witness is Lt. Gen. Kelly Burke.

General Burke, it is nice to see you again. We not only welcome you before the committee, but we ask you to identify those with you who may be testifying today.

Your full prepared statement will be printed in the record and you may summarize it for the committee. I understand you also have a briefing on the alternate engine program as a means of backgrounding the committee on this issue. Please proceed.

Let me ask my colleagues if they have any opening statements to make.

STATEMENT OF SENATOR CHILES

NEED FOR F-100 ENGINE ALTERNATIVES

Senator CHILES. We have heard a lot about Pratt & Whitney's F-100 engine and about General Electric's F-101 derivative engine.

Regrettably, what we have heard has left a great deal of confusion on the part of this committee, and I have no doubt on the part of the other committees involved.

I hope that this hearing will allow us to at last resolve some pressing questions, since we now have in the same room and at the same time spokesmen for the Air Force, for General Electric, and for Pratt & Whitney.

There are several important issues which I hope we can shed some light upon today.

Do we need and is it cost effective to have an alternative to the F-100 engine for current mission requirements?

The Air Force embarked on its development of the F-101 derivative, saying that an alternative to the Pratt F-100 is necessary because of maintainability and reliability problems being encountered prior to 1979.

The Air Force, before this and other committees, has testified that the problems with the F-100 engine were caused by the Department's desire to accelerate the availability of the F-100 engine, and that the problems associated with the engine are now largely worked out.

Pratt is now offering a 2-year, no-cost warranty and plans a 10-year warranty on its engine by 1985, about the time that the alternative engine could be available.

COMPETITION

I for one feel very comfortable with the notion of competition to keep price and ultimately costs down while assuring higher quality than would otherwise be the case.

We should remember that we had a competition when the F-100 was originally selected.

That is how Pratt came to produce this engine for the Air Force.

The Defense Department's cost analysis improvement group looked at the issue of substituting the General Electric engine for the Pratt F-100, and concluded that it wasn't cost effective.

This Pentagon team found that "in fiscal year 1981 dollars, the additional life-cycle costs of the F-101 DFE vs the F-100 engine would be over one-half billion dollars."

It doesn't sound like competition at this point is going to do us much good.

HIGH-THRUST ENGINES

I understand that the Air Force has testified repeatedly that they are not seeking a higher thrust engine.

The fact is, that the General Electric F-101 derivative engine has substantially higher thrust: 28,000 pounds versus 24,000 pounds for the Pratt engine.

They say that this thrust advantage is offset by the higher weight of the General Electric engine, that the thrust to weight ratios are approximately the same.

Yet, we all know that with a modest redesign of the inlet size of the F-16E, the General Electric engine will have substantial additional thrust.

Apparently, the Air Force intends to ignore this important advantage, because they claim that in seeking an alternative for the Pratt engine for the current mission, thrust will not be a criterion.

At some point there is no doubt going to be a competition between these two engines for the current mission.

What I find hard to believe is that if these engines turn out to be very similar in other aspects of the competition, will the Air Force ignore the potentially higher thrust of the General Electric engine.

Of course they won't ignore it. They will come in and tell us that things have now changed somewhat, and that it makes sense to buy the engine with the higher thrust, given that other elements of the comparison are the same. That only makes commonsense.

NECESSITY FOR HIGHER-THRUST ENGINES

Finally what is the potential for higher thrust being a necessity?

Well, we know from previous Air Force analyses and testimony that aircraft tend to grow in weight about 2 percent per year. This happens because we continually reevaluate the thrust and continually upgrade subsystems in the aircraft. And with those upgrades on average we add weight.

Again, commonsense leads me to the conclusion that thrust is an issue, and that if we don't recognize it now, we won't be in a position to do something about it later.

Mr. Chairman, the decisions we are confronted with today are going to shape our Air Force through the end of the century. I most appreciate your taking the time to hold these hearings today.

OPENING REMARKS OF GENERAL BURKE

Senator STEVENS. Anyone else have any opening statements to make?

If not, we will be happy to have you proceed, General.

INTRODUCTION OF ASSOCIATES

General BURKE. Thank you very much, we are honored to be with you to discuss this important issue.

I brought with me today on my left, General Marshall who has responsibility for development and acquisition for the Air Force, and on my right Gen. Bob Russ who is our director of operational requirements and comes to us with a long and extensive background in fighter operations.

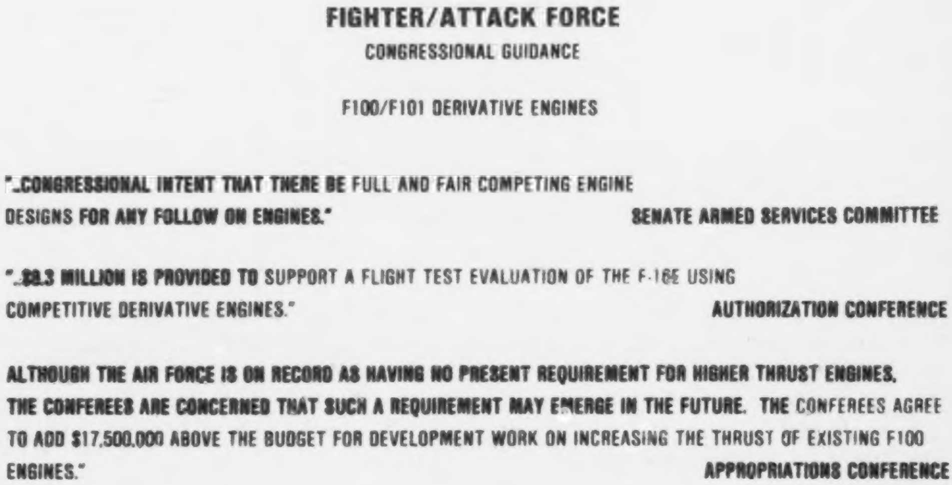
Rather than summarize my statement, I would just like to offer it for submission for the record and move right into the briefing, saying only that I would agree exactly with your opening comments.

COMPETITION PROGRAM

We do share the same goal and that is to derive a full and fair competition between two outstanding engines. That is our goal. We have put together a plan and a program that we think will achieve that goal. Our briefing will outline that program for your judgment to see whether or not we have structured it to insure that the competition is as we want it.

With that, I would like to go into my briefing. It will take about 15 minutes.

Senator STEVENS. Please.



FIGHTER/ATTACK FORCE

CONGRESSIONAL GUIDANCE

F100/F101 DERIVATIVE ENGINES

"...CONGRESSIONAL INTENT THAT THERE BE FULL AND FAIR COMPETING ENGINE DESIGNS FOR ANY FOLLOW ON ENGINES." SENATE ARMED SERVICES COMMITTEE

"...$9.3 MILLION IS PROVIDED TO SUPPORT A FLIGHT TEST EVALUATION OF THE F-16E USING COMPETITIVE DERIVATIVE ENGINES." AUTHORIZATION CONFERENCE

ALTHOUGH THE AIR FORCE IS ON RECORD AS HAVING NO PRESENT REQUIREMENT FOR HIGHER THRUST ENGINES, THE CONFEREES ARE CONCERNED THAT SUCH A REQUIREMENT MAY EMERGE IN THE FUTURE. THE CONFEREES AGREE TO ADD $17,500,000 ABOVE THE BUDGET FOR DEVELOPMENT WORK ON INCREASING THE THRUST OF EXISTING F100 ENGINES." APPROPRIATIONS CONFERENCE

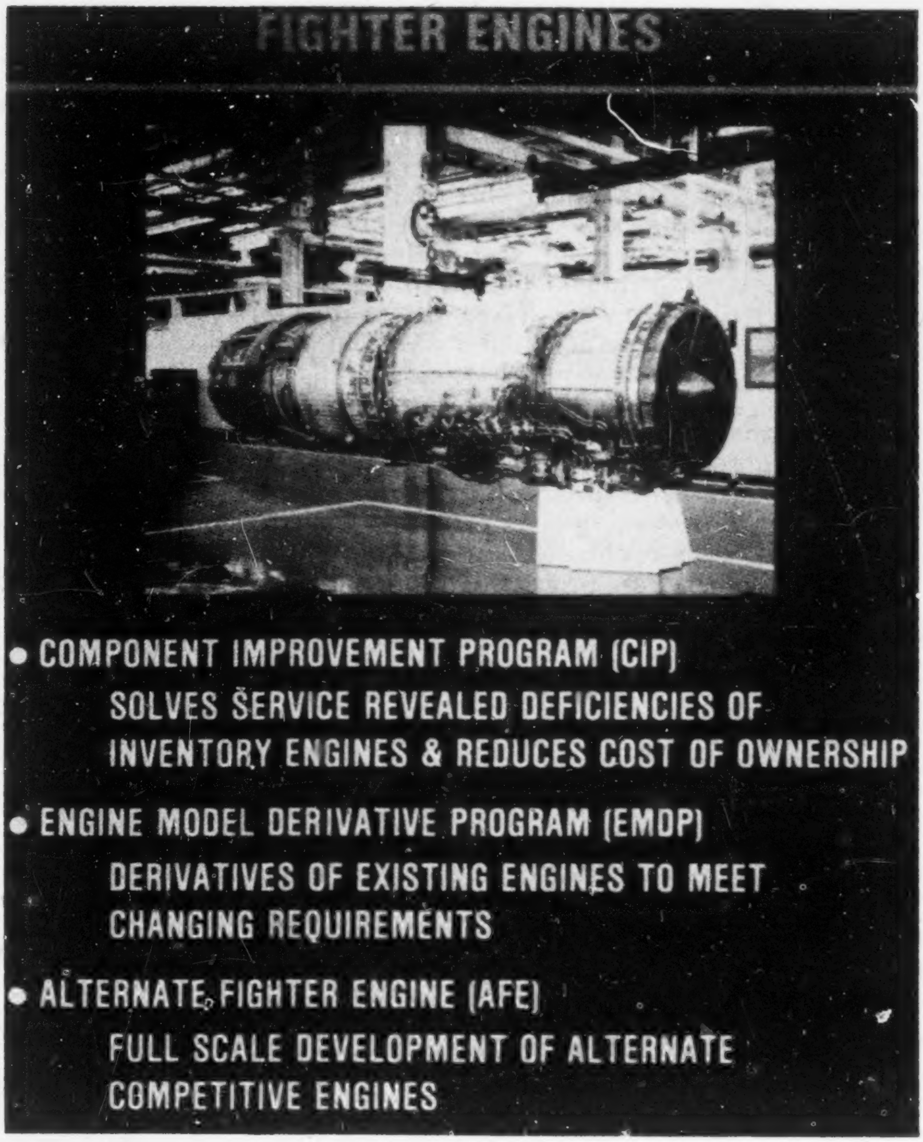
SLIDE 1

CONGRESSIONAL GUIDANCE REVIEW

General **Burke**. I would like to begin with a short review of the congressional guidance that preceded today's activity. The Armed Services Committee last year specified that there be full and fair competition in these engine designs. I will outline how we have set about providing that full and fair competition in subsequent slides.

Additionally in the authorization conference it was specified that we should support the flight test evaluation of the F-16E with both of these engines on it. That has been done. The first of those F-16 prototypes will fly in July. That will have the F-100 engine on it. The second will fly in September and will have the F-101 derivative engine.

Finally in the appropriations process the appropriations conferees noted that while the Air Force has not established a requirement for higher thrust, they expressed concern that such a requirement may later emerge, and provided $17.5 million for increasing the thrust of the existing F-100 engines. That was one of the several items, Mr. Chairman, that was involved in the appropriation, but not authorization process. That money was just recently released to us by OSD. We are processing it and putting it on contract as quickly as possible, so that we can do just what we were told.



FIGHTER ENGINES

- COMPONENT IMPROVEMENT PROGRAM (CIP)
  SOLVES SERVICE REVEALED DEFICIENCIES OF INVENTORY ENGINES & REDUCES COST OF OWNERSHIP
- ENGINE MODEL DERIVATIVE PROGRAM (EMDP)
  DERIVATIVES OF EXISTING ENGINES TO MEET CHANGING REQUIREMENTS
- ALTERNATE FIGHTER ENGINE (AFE)
  FULL SCALE DEVELOPMENT OF ALTERNATE COMPETITIVE ENGINES

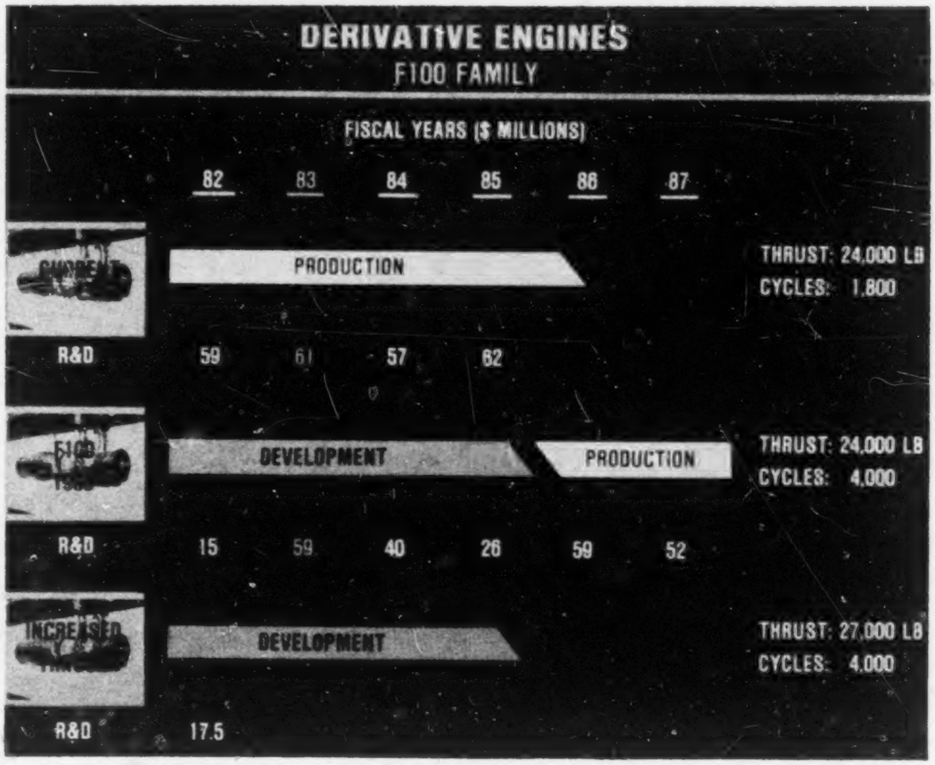
Slide 2

FIGHTER ENGINE (R&D)

Fighter engine research and development is a little difficult to follow because we divide the work in several areas. We have to look at all of them to understand the totality of the program.

First, we have for all of our in-service engines a component improvement program designed primarily to reduce the cost of ownership of those engines. As you operate engines you gain experience. We see by changing this we save money. Then we look at in-service engines for opportunities to increase their capability through the engine model derivative program. Again, we are doing work on the F-100 in that area.

Finally, when the product improvements reach sufficient maturity to move into full-scale development, we put them into the alternate fighter engine program, and at that time, we would do the full-scale development. We will talk a little about each of those.



DERIVATIVE ENGINES
F100 FAMILY

FISCAL YEARS ($ MILLIONS)

	82	83	84	85	86	87	
	PRODUCTION						THRUST: 24,000 LB CYCLES: 1,800
R&D	59	61	57	62			
	DEVELOPMENT				PRODUCTION		THRUST: 24,000 LB CYCLES: 4,000
R&D	15	59	40	26	59	52	
	DEVELOPMENT						THRUST: 27,000 LB CYCLES: 4,000
R&D	17.5						

Slide 3

VERSIONS OF F-100 ENGINE

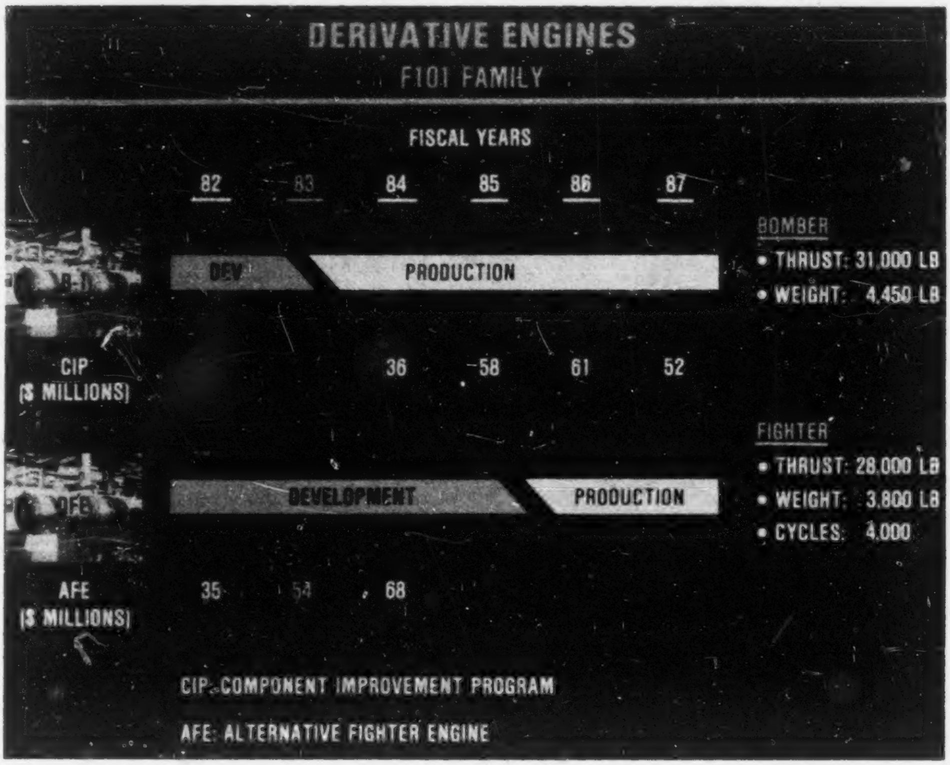
Referring specifically to the F-100 engines, I think the committee will note there are three versions of this engine that are commonly discussed.

The first is the engine that we have now, the current engine in service coming off the production line right now. That is a 24,000-pound thrust engine. It has a repair overhaul time of 1,800 cycles which is about 900 flying hours. That is, it started at 900 cycles. We raised it up to 1,350. Now we have it up to 1,800 cycles.

The engine we are obtaining in 1986 will have a 4,000-cycle change. There is an enormous amount of difference in the cost of these two versions. There is a multibillion-dollar savings if we can achieve that reduction. The research and development funds go for the first version. These engines are getting an increased time between repair cycles.

A third variant would be an engine with a 4,000-cycle overhaul time, but with increased thrust of 27,000 pounds. It is for that purpose that Congress added the $17.5 million last year.

The Air Force has continued to examine that question and has not found a military requirement for the increased thrust in either of these engines, and hence has not recommended the moneys in 1983 and beyond that it would take to do this. It would take perhaps $174 million to carry that through to production grade configuration.


B-1
DFE
DEV
PRODUCTION
DEVELOPMENT
PRODUCTION

DERIVATIVE ENGINES

F101 FAMILY

FISCAL YEARS

	82	83	84	85	86	87
CIP ($ MILLIONS)			36	58	61	52
AFE ($ MILLIONS)	35	54	68			

BOMBER
- THRUST: 31,000 LB
- WEIGHT: 4,450 LB

FIGHTER
- THRUST: 28,000 LB
- WEIGHT: 3,800 LB
- CYCLES: 4,000

CIP: COMPONENT IMPROVEMENT PROGRAM

AFE: ALTERNATIVE FIGHTER ENGINE

SLIDE 4

F-101 BOMBER ENGINE

Looking at the F-101 engine there are two versions of it. The first is the bomber engine. We will be spending research and development moneys for a component improvement program for that engine, as it comes along. The fighter version is about 700 pounds heavier than the F-100. It has demonstrated the 4,000-cycle overhaul.

In the alternate fighter engine program, we have these moneys identified for the F-101 derivative fighter engine. The purpose of that money is to get the engine into production-ready configuration.

DERIVATIVE ENGINES

	F101	VS	F100
MAXIMUM			
UNINSTALLED THRUST (LB)	27,900		23,800
INSTALLED F-16 THRUST (LB)	20,200		19,400
INTERMEDIATE			
UNINSTALLED THRUST (LB)	16,700		14,700
INSTALLED F-16 THRUST (LB)	12,700		12,100
CYCLES	4,000		4,000

BOTH ENGINES MEET PERFORMANCE REQUIREMENTS

COMPETITION BASED ON:

- LIFE CYCLE COST
- RELIABILITY
- DURABILITY
- MAINTAINABILITY
- WARRANTY
- OPERABILITY

SLIDE 5

ENGINE THRUST

To make some side-by-side comparisons of the two, generally, when people talk about thrust they talk about uninstalled thrust. That is not of much interest to a pilot or operator. Uninstalled, there is a major difference between the F-101 and the F-100. Installed in the existing F-16 airplane or F-16E, if we should go to that, that is different, it drops to about 800 pounds difference. That is sea level, static.

If you flew an F-16 at low altitude and high speed with the throttle in afterburner you would run out of fuel in 10 minutes. So probably 99 percent of engine operations are in this range, which is military power, intermediate, anything below the afterburner. There, the number drops considerably.

Installed in the F-16, there is about 600 pounds thrust edge over the F-101, as opposed to the F-100, against about 700 pounds weight increase associated with the F-101 engine.

It is true that we could redesign the inlet in the F-16 and get that number somewhat higher, but that is obviously a thing we don't want to do if we can possibly avoid it. That is a major aerodynamic change in an airplane and it is something we don't desire to do, and we will make every effort to avoid it.

The F-101 has demonstrated the durability we are seeking and, in a few years, we believe we can demonstrate it with the F-100 as well. So, the competition is not based on thrust. Both engines will provide more than adequate performance.

The F-16 is in my judgment the finest performing single engine fighter in the world today. There is no doubt that the engines can give the thrust necessary. Competition ought to be based on these factors.

Cost, of course, is critical. We want engines that are as reliable as the manufacturers can make them so that when we send an airplane out on the mission it will complete the mission and return the pilot safely. We want durability. In particular we want this 4,000 cycle. When things do break, we want them to be easier to fix.

We want the engine in which the manufacturer has sufficient confidence that he will give us guarantees that he can meet those goals. And finally, we want an engine that is operable without any restriction.

We still have a few concerns about the F-100 engine in the flight envelope. It is noted in the flight manual, that the pilot is to be careful about moving the throttle under these conditions. We would like that out. We would like a pilot in a combat situation to be able to do anything he wants to with the throttle without concern. We want him to fly the airplane to its maximum capability and not be inhibited by limitations of the engine. We think we can clear that up very nicely in the F-100.

ENGINE COMPARISONS FOR F-16E

Some additional comparisons in terms of performance between the engines, I will show you a series of charts. We are going to focus on the F-16E.

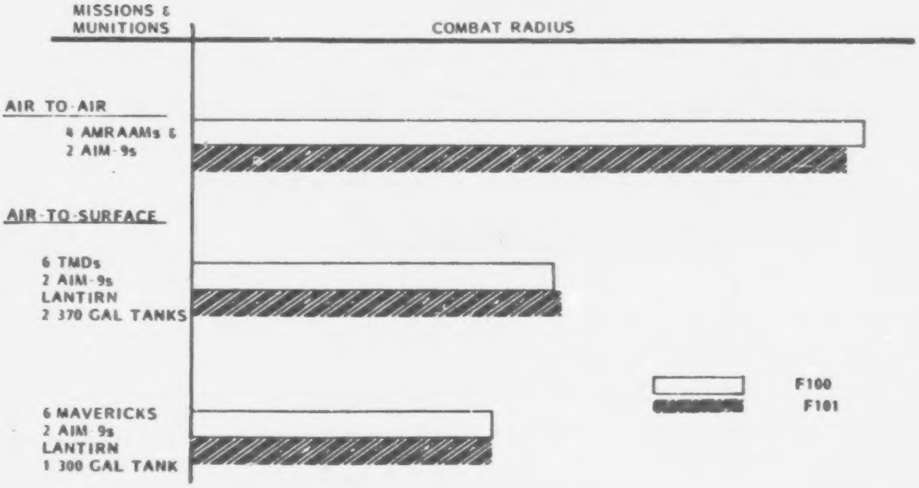
I might say that we planned to continue the balanced buy of the F-16 and F-15 aircraft until we have a new fighter in the 1990's. The bulk of the F-16's will be C and D models. I don't think there is any question in anybody's mind that the performance of the F-100 is more than adequate for that purpose.

GD has made an assessment of the engine performance required for the F-16E and concludes that the F-100 is fine for the purpose. We have made an assessment and reached the same conclusion, but we can't prove it until we fly the airplane later this year. So the concern, the most concern, is the possibility that if we might select the F-16E over the F-15E and our calculations would be proven incorrect, the higher thrust would be required.

I think it is worth remembering if all that happens, and I don't think it is going to, that would represent 400 engines plus spares out of a total buy of perhaps 3,000.

RANGE/PAYLOAD COMPARISONS

F-16E/F100 vs F101 ENGINES



Slide 6

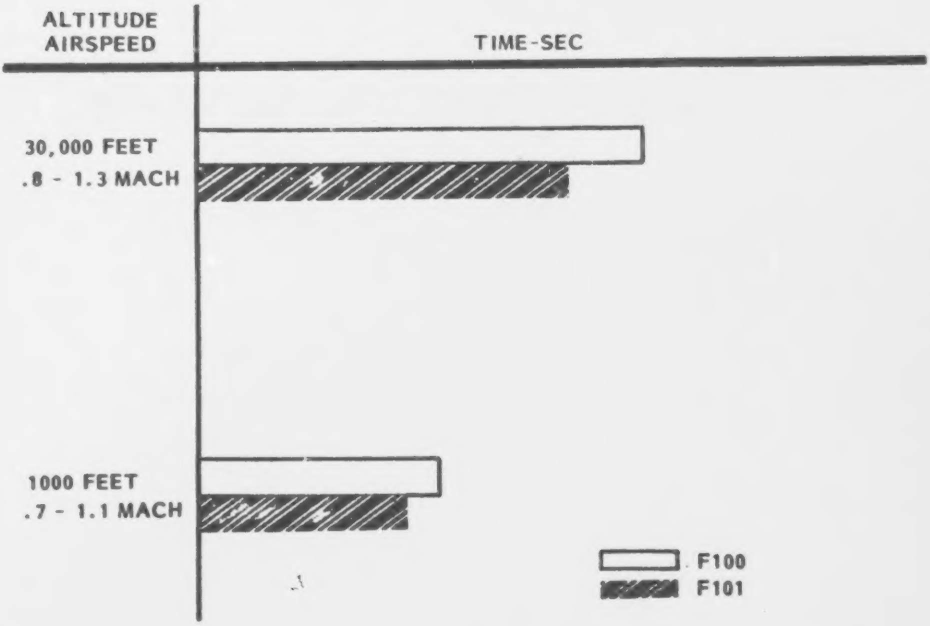
AIR-TO-SURFACE ROLE VARIATIONS

This chart shows the range and payload comparisons.

On the air-to-air mission with the F-16E, a trivial advantage to the F-100; indistinguishably different in the air-to-surface role. There is nothing there that would swing you one way or the other to either engine.

ACCELERATION TIME COMPARISON (MAX POWER)

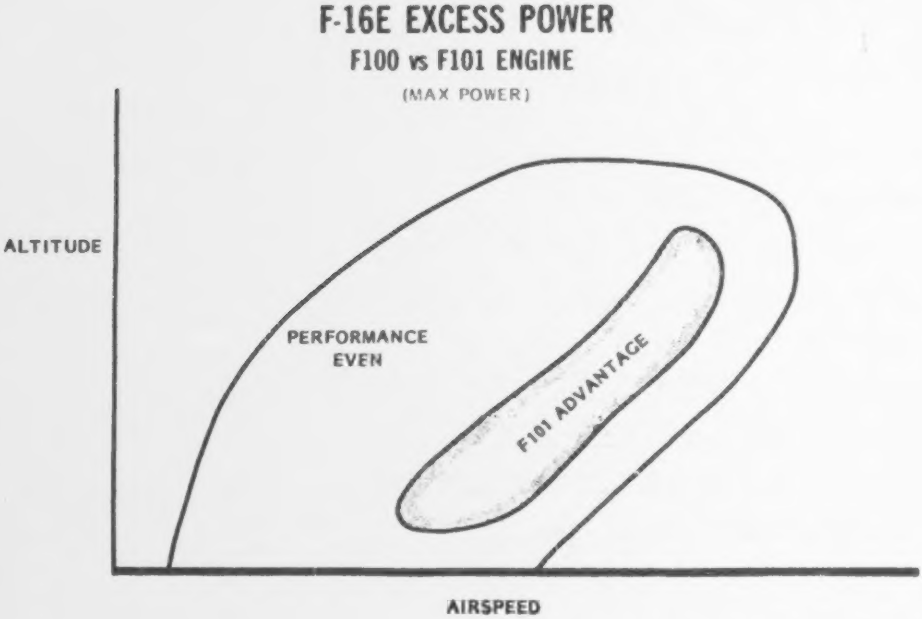
F-16E / F100 vs F101 ENGINES



SLIDE 7

ENGINE ACCELERATION

Acceleration, a little edge goes to the higher thrust engine as you might expect, a few seconds. That is a desirable feature. It is nice to have, but you would not give up those other features I talked about, operability, durability, maintainability for increased acceleration.



SLIDE 8

EXCESS POWER FEATURES

Another interesting way to look at it is excess power, which is the thing that is dear to the heart of any fighter pilot. This shows the flight envelope—I can't show numbers without being classified—higher altitude and higher speed, standard flight envelope. It shows for the bulk of the envelope there is an area here in which the F-101 has a very slight edge.

Again it is important to remember we are talking about the F-16E which we propose to buy primarily for a long-range strike aircraft and its basic mission would be to penetrate at 200 feet at high subsonic speed to target and return. That puts it down in this region here.

It has a secondary mission not of air-to-air dog fighting, but air-to-air defense mission and that takes place up here. So you can find a portion of the flight envelope where the F-101 engine has a slight edge, but it is not a portion that you are technically interested in.

F-16E PERFORMANCE FACTOR COMPARISON

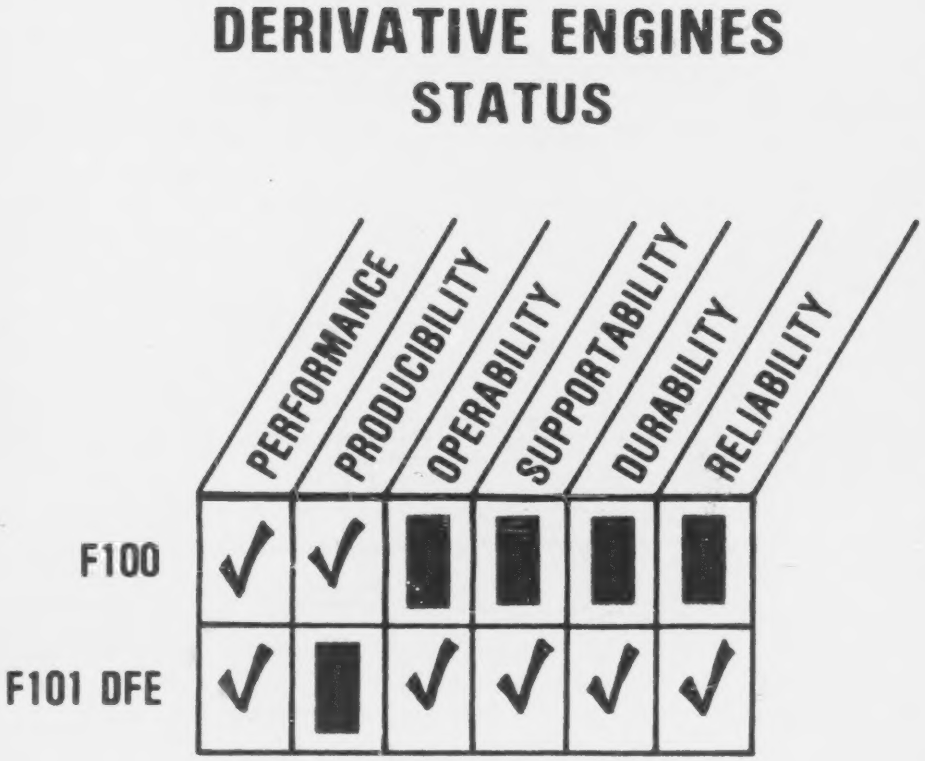
	ADVANTAGE	
FACTOR	F100	F101 DFE
MISSION RADIUS - AIR-TO-AIR	X	
MISSION RADIUS - AIR-TO-GROUND		X
ACCELERATION TIME - 30,000 FT		X
MAXIMUM AIR SPEED - SEA LEVEL		X
MAXIMUM AIR SPEED - 30,000 FT	X	
MAXIMUM SUSTAINED TURN RATE		X
MAXIMUM INSTANTANEOUS TURN RATE	X	
MANEUVERING POTENTIAL (1G)		
ENVELOPE, UPPER LEFT	X	
ENVELOPE, LOWER RIGHT		X
TAKEOFF GROUND ROLL		X

THE ADVANTAGES CITED ARE SMALL AND BOTH ENGINES PROVIDE ESSENTIALLY THE SAME CAPABILITY IN THE F-16.

Slide 9

ENGINE COMPARISONS

To summarize the comparison of the two, as you can see there is some advantage for the F–100. I won't go through all of them. Maneuvering potential is high and slow and on lower right is low and fast. The key point is that wherever there is an advantage it is slight and there is nothing there that would cause anybody to choose one engine over the other.



DERIVATIVE ENGINES STATUS

	PERFORMANCE	PRODUCIBILITY	OPERABILITY	SUPPORTABILITY	DURABILITY	RELIABILITY
F100	✓	✓	■	■	■	■
F101 DFE	✓	■	✓	✓	✓	✓

Slide 10

CURRENT ENGINE STATUS

In order to have a full and fair competition, we believe that it is necessary to have engines that have adequate performance, that are demonstrated production ready, that are operable as we would like them to be, that are maintainable or supportable; most important, that they have that durability, the 4,000 cycles, and reliability.

Looking at the current status of the two, in our judgment both engines have demonstrated more than adequate performance. So we don't think further investment is required in that area. The F-100 engine is in production and that is not a problem. The F-101 has demonstrated the performance we want, but is not yet a production engine. We want some improvement in the operability, supportability, durability, and reliability of the F-100.

Our investment in these programs is aimed at changing those yellow blocks into checks so that everybody is full up and ready to proceed.

FUNDING SUMMARY

($ IN MILLIONS)

PRATT & WHITNEY F100	FY 82	FY 83	FY 84
FULL SCALE DEV DEEC		40	15
MAIN FUEL PUMP		10	14
CIP	59	61	57
EMDP	32	8	12
TOTAL	91	119	98

GENERAL ELECTRIC F101 DFE	FY 82	FY 83	FY 84
FULL SCALE DEV	35	54	68
TOTAL	35	54	68

SLIDE 11

ENGINE FUNDING BREAKDOWN

Here is how this would show up in the budget documentation that is submitted for your consideration. This shows the funding for research and development for the two engines, 1982, 1983, and 1984.

Looking at the current year we are in full-scale development for the digital electronic engine control which is a key element of improving the F-100 to the level we want. All the activity in the F-101 is full-scale development.

Additionally, in the F-100 we are developing a much more reliable main fuel pump. Particularly we need that on the single engine aircraft.

In the component improvement program, we talk about correcting deficiencies and defects in operation and reducing cost of ownership. Substantial money for the F-100 program and an additional $8 million in the engine model derivative program looking at product enhancement.

So in 1983, $119 million total for research and development for the F-100 engine, to correct the engine, not to increase thrust, and $54 million in 1983 for the F-101 derivative.

By 1984 this will get these engines to the level necessary so that both are fully competitive.

CONCLUDING REMARKS

To conclude and summarize our view, we believe in competition. We think it is enormously beneficial to the Government. If we are going to have this competition we have to have two engines to compete. To do that they have to meet our requirements. They have to be producible and operable, durable, maintainable, and reliable. That is what our program is going on.

It is important to remember that we are going to spend billions of dollars buying fighter engines. Probably once we get to competition we will buy another 10 billion dollars worth of engines, either F-100 or F-101, before we go to a new generation of fighter. I think competition will save us $1 billion in that capital investment.

Even more importantly, to operate those engines over their lifetime of 20 years will cost us another $8 billion. We think that can be reduced by perhaps as much as $4 billion. There might be a total savings to the Government of about $5 billion with this competition.

To conclude, we see the payoff to the country in better engines and lower cost. That is why we are making the recommendation.

That concludes my presentation, sir. I will be happy to try to answer any questions.

[The statement of Gen. Kelly H. Burke follows:]

PREPARED STATEMENT OF LT. GEN. KELLY H. BURKE

DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT, AND ACQUISITION

U. S. AIR FORCE

Mr Chairman and Members of the Subcommittee:

I am pleased to appear before you to discuss the Air Force's Alternate Fighter Engine Program. Today, I will briefly address the background of this program and how it has evolved into the program proposed in the FY 1983 budget request.

In the late seventies, General Electric (GE) built a fighter engine derivative demonstrator of the F101 bomber engine. They were motivated by the problems the Navy was having with the TF30 and the Air Force was having with the F100. The Air Force had invested over $600M in the development of the F101 bomber engine, yet there was no planned production since the B-1 program had been cancelled. The GE approach was to use the core of the bomber engine intact - the compressor, combustor and high pressure turbine - and develop a new fan, low pressure turbine and afterburner for the fighter engine. This effort was completed with an in-house demonstration in 1978 at an investment by GE of $16 million.

In 1979, the Air Force was faced with serious durability problems with the Pratt & Whitney F100 engine. These durability problems were compounded by strikes at two key vendors such that in the fall of 1979, the Air Force was short approximately 90 engines. This situation resulted in national attention and formal Congressional hearings.

As a direct result of this situation, Congress provided $33 million under the Engine Model Derivative Program (EMDP) to begin the limited development of the already demonstrated General Electric F101 Derivative Fighter Engine (DFE). The primary interest in the F101 DFE was to provide an alternate engine in the event proposed technical solutions for the F100 and TF30 engine were not successful. Also, since both our front line fighters have the F100, we remain vulnerable to technical and support problems. The strike and durability problems with the F100 in 1979 and 1980 highlighted the problems we could face in wartime.

The F101 DFE proved to be a very successful program. Durability and operability achievements, yet to be accomplished by the F100 engine, were demonstrated. Hot section durability equivalent to 2,000 hours (approximately 4,000 cycle) was demonstrated in Accelerated Mission Testing. In contrast, the F100 fleet is 1350 cycles. F100 new production since March 1982 has the design goal of 1800 cycles. Durability testing is continuing for the F101 DFE with the expectation that cold part life of 4,000 hours can also be demonstrated. Unrestricted throttle movement throughout the flight envelope has been demonstrated at the Arnold Engineering Development Center and in flight testing in the F-16 and F-14.

In FY 1980, Congress added $13.3 million to the Air Force request of $16.7 million providing a total of $30.0 million to continue the limited development of the F101 DFE. In FY 1981, Congress again added funds ($25 million) to the Air Force request for the F101 DFE bringing the total FY 81 F101 DFE funding to $52.2 million. The language stated that the funds were to be used for an expanded ground test program and did not represent a commitment to full scale development.

Since the F101 DFE had completed the limited development objectives under the Engine Model Derivative Program (EMDP) in FY 1981, the Air Force proposed in FY 1982 to include $35 million under a separate program, the Alternate Fighter Engine (PE 64223F), for a transition to full scale development. In documentation to Congress, the Air Force stated two factors influencing its decision to continue the F101 DFE FY 1982 program: (1) it would be premature to foreclose the option of initiating full scale development of the F101 DFE before proposed F100 technical solutions were successfully demonstrated and incorporated into the inventory and (2) continuance of the F101 DFE will maintain the competitive environment in the high thrust afterburning fighter engine business. The FY 1982 F101 DFE program is structured to extend the limited development by shifting engineering efforts to assuring design producibility, accomplishing additional durability testing, as well as tailoring the exterior dimensions of the engine to allow installation in the F-15. Also included are the necessary long lead items to support the acquisition of five test engines which would be required in FY 1983 for full scale development.

Today, the picture is substantially different than it was in 1979. Early in the summer of 1981, the F100 engine program recovered from its labor disputes to the original contract schedule. Subsequently, the F100 emphasis has been focused on the supportability of our fighter engine fleet, which has improved. Intensive efforts by the Air Force overhaul facility at San Antonio and the contractor allowed us to satisfy F100 overhaul and field requirements during a demanding period last summer. Furthermore, programs within the Component Improvement Program (CIP) have been established for the core of the F100 engine to achieve 2,000 hours life as compared to approximately 900 hours for new F100 engines today. Thus, because of the improvement in F100 supportability and stabilization of very critical problems, the CIP can focus on achieving the original durability goal.

Several recent developments have strengthened our perspectives on competition. The approval of the B-1 program and the KC-135 reengining establishes the logistics system for the core of the F101 DFE. The approximately 50,000 hours total test time on the common core of these engines adds to our confidence in the F101 DFE. In addition, the Air Force is programming an expanding F-15/F-16 fleet for the eighties, which includes derivative aircraft (F-15E or F-16E). Also in 1982, Congress identified funds to ensure that the F-16E prototypes fly with competitive derivative engines.

It must be stressed that the F101 DFE program has never been pursued because of an Air Force requirement for increased thrust. Although the F101 DFE has 4,000 pounds more thrust than the F100, it also weighs 700 pounds more, consequently, the F101 DFE thrust-to-weight ratio (uninstalled) is actually less than the F100. The degree of comparability becomes more obvious when installed in an F-16 at sea level, stationary conditions. At that condition, the thrust of the F101 DFE is 20,200 pounds and the F100 is 19,400 pounds. This relationship varies with temperature and across the flight envelope. Both McDonnell Douglas and General Dynamics believe that the thrust of the F-100 is adequate for the current F-15 and F-16 and for the contemplated derivatives of these aircraft. Our studies on today's F-15 and F-16 have shown that in the critical parameter of aircraft system performance, overall installed engine performance is comparable. By flying both the F100 and the F101 DFE in F-16E prototypes, we will be able to confirm our study results.

The acquisition strategy included in the FY 1983 budget request calls for initiating full scale development of the F101 DFE and the F100 Digital Electronic Engine Control (DEEC) so that we can compete these engines for acquisition in the mid-eighties. This competitive strategy could include F-16 C/D's, F-15 C/D's, derivative aircraft, or any combination. Since no system performance deficiencies have been identified based upon engine thrust-to-weight, the Pratt & Whitney F100, with DEEC and the improved life components available from CIP, will compete with the General Electric F101 DFE, with elements of competition focused on improved supportability, operability, availability, overall life cycle cost and the contractor's willingness to warrant his product. Thrust in excess of that currently available in the F100 is not a factor in this competition.

Thus, our FY 1983 request funds the F101 DFE to provide an engine qualified for production and it also funds enhancements for the F100 for increased durability, increased operability, and decreased support. This will allow for these engines to compete in an even-handed manner. FY 1983 R&D funding for the two fighter engine programs is $119 million for the F100 and $55 million for the F101 DFE.

Other than the fact that derivative aircraft offer obvious break points for the opportunity to compete, the F101 DFE and the F100 with DEEC are not related to the F-15E or F-16E. As we view the increased buy of F-15 and F-16 in various configurations and the overall competitive environment in high thrust fighter turbine engines, we see a great opportunity to obtain better engines at lower costs through the pressure of competition.

Proceeding with the program as structured offers many procurement options for the mid-eighties, and we realize that the detailed implementation plan for a competition must be carefully tailored. The proposed Alternate Fighter Engine program in FY 1983 is the critical link in sustaining the Congressional emphasis on competition in fighter engines. Without sufficient funding to complete the development of the F101 DFE and the DEEC for the F100, the competitive environment we are attempting to foster will disappear.

Mr. Chairman, this completes my prepared statement. I will be glad to answer any questions you may have.

THRUST-TO-WEIGHT RATIO

Senator **Stevens**. You did not have a thrust-to-weight ratio involved there, General. Is that a reliable indicator? Do you use it at all in your comparison?

General **Burke**. Yes, sir, it is one of many important indicators that we have. We will dig that out. We do have it.

You can look at the thrust-to-weight ratio of the engine alone in which case that is going to come out a wash because the F-101 has about as much additional weight as it does additional thrust or you can look to thrust-to-weight of the total airplane in which case there will be a very slight advantage to the F-101.

Senator **Stevens**. You don't compare the engines themselves on a thrust-to-weight basis?

General **Burke**. Yes, sir, you can look at just the engine or you can look at the engine as part of the total airplane including the engine.

IMPORTANCE OF THRUST-TO-WEIGHT IN COMPETITION

Senator **Stevens**. Will the thrust-to-weight be important in a competition between the two?

General **Burke**. Not beyond the level that is adequate to our needs. It is imperative that we have sufficient thrust-to-weight to provide the needed performance. It is desirable that we have some additional thrust-to-weight and we do in both engines, but increased thrust has diminishing marginal utility and each increment is worth less than the last.

To get to the thrust that you need, it is critical. Beyond that it is of less and less value.

Senator **Stevens**. You say the money that we provided last year has now been released?

General **Burke**. It was just released to us by OSD and we are processing it in the normal manner to get it on contract.

Senator **Stevens**. Do you think it will meet the cost-effective goal that we set out last year in the conference committee report when that money was outlined?

General **Burke**. I think the total program that we just outlined is indeed a cost-effective approach. I think although the Air Force does not recommend spending money for increased thrust, I think the things that Pratt & Whitney will do toward that increased thrust will also have implications for improving the other features that I spoke about, operability, durability, and so forth.

Senator **Stevens**. Are you looking to both increased thrust and the possibility of decreasing weight on the F-101?

General **Burke**. No, sir, we are not looking at either. It is possible to increase the thrust of the F-101. We actually decreased it when we took it from the bomber to the fighter so there are ways it could be returned.

Once again we don't think it is necessary or desirable. Once you have all the thrust you need, then the proper place to put the emphasis is on the durability and reliability and maintainability.

Senator **Stevens**. You would say that neither thrust nor weight is really important in the competition that is going to be ahead?

General **Burke**. No, sir. The difference in thrust and weight between those engines will not be of importance in the competition.

Senator **Stevens**. I have a series of questions that we will submit to you later.

Do you gentlemen have any questions?

PROBLEMS OF DURABILITY WITH F-100 ENGINE

Senator **Andrews**. In your statement you indicate that all the durability problems previously encountered with the F-100 engine have been resolved. Yet on the chart you show nothing but yellow blocks.

How do you run the one with the other? Is that just a typical Air Force hedge?

General **Burke**. I don't think I said it quite that flatly in my statement.

Pratt & Whitney has done a superb job in meeting our intermediate goals for durability. They started with an engine that had an overall time of 900 cycles. They threw the full weight of their company in improving that. They met the intermediate goal of 1,350 cycles. That is what we have in the engines in the field now for the most part. They have continued to work at that.

The engines that are now coming out of the production line are 1,800. That is good progress. It has met our intermediate goal.

Our final goal is 4,000 cycles. The difference between a 1,800-cycle overhaul and 4,000 cycles is billions of dollars.

Senator **Andrews**. I fully agree with you. In your analysis of the life cycle cost what are the individual cost factors you are going to look at? Do you include the total developmental cost, the cost of additional maintenance capability, and cost of bringing new items into the inventory?

General **Burke**. Indeed, yes, sir.

Senator **Andrews**. How do you check off total durability of 4,000 hours on an engine that is not in production when you haven't found out what durability is on an engine that is in production?

General **Burke**. We have found out the durability. We have a good understanding of what the durability of the F-100 is. It is 1,350 or 1,800, depending on which specific engine. We demonstrate this through accelerated mission testing. We just run those engines day and night, tear them apart.

Senator **Andrews**. You run production line engines there, and the other one where you have checked off durability in the charts you showed us a moment ago is the prototype engine, not a production engine?

General **Burke**. That is correct. That is what the additional money for the F-101 goes for. We have proven that the prototype engine has that kind of durability. We now have to prove the production engine does.

ADDITIONAL THRUST CONSIDERED A NONISSUE

Senator **Andrews**. You mentioned the issue of additional thrust is a nonissue.

How can you assure the Congress that isn't going to enter into the evaluation of the engine?

General **Burke**. When we formally compete that, we will provide the competitors with a list of criteria by which we will make a selection. We will certainly provide that to you if you like, sir.

COPRODUCTION AGREEMENT WITH NATO ALLIES

Senator **Andrews**. We are talking about commonality with our NATO partners. NATO gets a big play in the subcommittee from time to time. If you introduce a new engine, doesn't that fly in the face of this commonality as far as violating the coproduction of the program that we have with our NATO allies?

General **Burke**. No, sir, it would not violate any agreement that we have, or we expect to have, with our NATO allies.

To the extent that one engine is common with those of our European allies, that is a plus for it.

Senator **Andrews**. We have a coproduction agreement with them. If we introduce a new engine in that inventory——

General **Burke**. The coproduction does not extend to the time period we are talking about. We are talking about competition that would procure engines in 1984, actual delivery in 1986. That is well past the coproduction agreement.

Senator **Andrews**. So you don't think that is going to impact on their decision for follow-on buys, whether or not they are going to continue investment in coproduction facilities?

General **Burke**. If the F-101 engine were selected to go into some of the F-16's, it certainly would not preclude F-100's going into other of the F-16's that were preferred by the customers.

Senator **Andrews**. They are kind of skittish about us anyway. We are going to set up this program. We are going to let you make some of the parts of this engine, if not all the engines. We are going to do it through a considerable time span.

Now all of a sudden we are changing the signals on them.

General **Burke**. We will have completed all of our agreements with our European allies well before this becomes an issue.

I am Chairman of the F-16 Multi-National Configuration Control Group and I meet regularly, General Marshall more often than I, with those Europeans. I haven't heard any expressions of concern or dissatisfaction.

Senator **Andrews**. As more and more come into the inventory, the concern will grow, and opportunity for commonality will grow. You say you have checked into it thoroughly?

General **Burke**. As I said earlier, commonality with our NATO allies is a plus. It is one thing that should be thought of. It should not dominate either.

Senator **Andrews**. I will try to get more information on that later.

Thank you, Mr. Chairman.

Senator **Stevens**. Mr. Rudman.

DURABILITY AND RELIABILITY OF PRATT & WHITNEY ENGINE

Senator **Rudman**. General Burke, after going through all the documents that most of us have received, reading them, and trying to separate the salesmanship from facts, if I understand the bottom line, what you are saying today is that your expectation is that the

Pratt & Whitney engine will meet the durability and reliability functions which you stress, as being the most important to the Air Force?

General **Burke**. I have very high expectations they will do that.

Senator **Rudman**. You think they will meet them under this program?

General **Burke**. Yes, sir.

Senator **Rudman**. You will end up at some point, toward the end of fiscal year 1983, with two engines which essentially will be equal, as far as you are concerned, in terms of performance because your claim is that the increased thrust in that engine is of importance to you in the flight envelope?

General **Burke**. That view is supported by both airframe manufacturers.

Senator **Rudman**. I accept that. You are saying you will have two engines that will perform as you wish them to perform throughout the flight envelope and they will be durable and reliable to the extent you want them to be, particularly the 2,000-hour, 4,000-cycle figure. At that point you have two to pick from.

How many engines in all are we talking about over the period 1983 through the end of the decade?

General **Burke**. That will be on the order of 3,000 additional engines of that class procured in that period by us.

Senator **Rudman**. Approximately 3,000 engines?

General **Burke**. Yes.

Senator **Rudman**. Then you would make the decision based on what, price and warranty?

General **Burke**. Assuming they met the goals, price and warranty would be the determinant.

Senator **Rudman**. Are you relatively confident that the cycle requirement will be met? Do you have information that leads you to believe that Pratt & Whitney will meet that, because looking at the history of the F-100, the maintenance history of it, that obviously is your major problem.

General **Burke**. I have a great deal of confidence. You will be talking to them later, but I think they have done a superlative job in meeting those intermediate goals. They seem to be on a path that is leading to success. I would have every expectation they will continue.

POWER APPLICATION LIMITATION

Senator **Rudman**. How about the power application limitation that exists in certain parts of the flight envelope on the F-100?

General **Burke**. I think the digital electronic engine control will do away with that at one swoop.

Senator **Rudman**. At what point do you expect that to be ready for production?

General **Burke**. We have moved into full-scale development and it will be ready for production on engines ordered in 1984 to be delivered in early 1986.

Senator **Rudman**. A completion of that is required for the F-100. It is not required for the F-101. Am I correct?

General **Burke**. You are correct.

Senator RUDMAN. Thank you, Mr. Chairman.

Senator STEVENS. Senator Schmitt.

Senator SCHMITT. Mr. Chairman, thank you.

CURRENT OPERATING LIMITATIONS ON F-100 ENGINE

General Burke, you and I both have flown jet aircraft. It is awful nice in periods of emergency, which I have had—I have never had periods of combat, but I am sure they are somewhat similar psychologically—to be able to demand whatever is necessary from the engine under you.

Every engine in some point in its history has had certain operating limitations placed on it as a result of experience. Can you be a little bit more specific with the committee on what the operating limitations are currently on the F-100 engine?

General BURKE. Let me ask General Russ, who has had considerably more experience flying that engine than I have, to make a comment.

General RUSS. Operating limitations are right now in the upper left-hand part of the envelope. It is slow, let us say, above 30,000 feet, below 200 knots. You have to be very careful with the cycling in and out of the afterburner because you may get a stall/stagnation, stall followed by stagnation. That is the sort of operating limitation.

Now we also are concerned about the cycle that we have on the airplane. While we are not as concerned now as we were, let us say, 2 years ago when we were only getting 900 cycles. Now we are doubling that cycle. We are very careful in telling the pilot not to cycle the engine from idle to full military too frequently because if you do that 4 times that counts for 1 full cycle and you have only 1,800 of those, and that engine has to come out and go to complete overhaul.

You can imagine in an air-to-air battle where the fight is going on pretty hot and heavy there are quite a few of those idle-to-full-military power movements. So we have restricted training, somewhat, of the pilots by telling them not to do that so often. We would not like to do that because we don't think that is the best way to do it.

So as we increase the cycles on the engine, then we will be able to take off that limitation.

Senator SCHMITT. Are there any other operating limitations on the use of the engine?

General RUSS. I can't think of any off the top of my head, sir. I am not positive whether there are or not. Those are the only ones I know of in the upper left-hand corner.

Senator SCHMITT. You do have timing in the after burner?

General RUSS. We have after burner time limits. In every aircraft you will have after burner limits because of the heat buildup. The airplane gets going too fast and it gets too hot and you have to throttle back.

OPERATING LIMITATIONS ON THE F-101 ENGINE

Senator SCHMITT. Would you compare what you have just described for the F-100 relative to the F-101 DFE? Do you know of any operating limitations that would be imposed on the F-101?

General RUSS. No, I don't right offhand. To be perfectly fair, we really didn't have any operating limitations on the F-100 when we started out. You get those operating limitations after you have worked with the airplane for a while and the operators get out and they fly it in the method in which they normally fight.

The experiences we have had on the F-101 is limited, albeit it looks very good, it is a brand new engine and we just haven't had the experience. I would assume if history repeats itself that we will probably have some problems with that later on.

HISTORY COMPARISON BETWEEN F-100 AND F-101

Senator SCHMITT. Have you compared the history of the two engines at equivalent stages of development? Were there any signs of the problems you encountered, operational problems you encountered with the F-100 during its comparable development period?

General RUSS. I haven't done an analysis on comparable periods of time, sir. We have looked at the history of the F-100 and the F-101. The problem is that both engines were developed differently. The F-101 has been derived as a result of some early engines. The F-100 pretty well started from scratch.

I can't give you a comparison between these two.

DIGITAL ELECTRONIC ENGINE CONTROL SYSTEM

Senator SCHMITT. Does the digital electronic engine control system cure the problem of operating limitations or does it just electronically prevent the pilot from overextending the engine, itself?

General BURKE. We expect it not only to cure those operability problems we are talking about, which are not all that important, although we would like to clean them up, but also to make a substantial reduction in the cost of maintaining. It will do away with the need to manually trim the engine. It will automatically trim itself.

Senator SCHMITT. Does this system electronically prevent the pilot from doing something he shouldn't?

General BURKE. No.

Senator SCHMITT. And limit the performance of the engine?

General BURKE. No.

Senator SCHMITT. Or does it in fact allow the full performance of the engine demanded by the pilot?

General BURKE. The latter.

Senator SCHMITT. What do you expect this to do with respect to the cycles?

General BURKE. I think it will be one of the steps that will help us enhance overall F-100 performance.

Senator SCHMITT. To get to 4,000?

General BURKE. No, it is the hot section improvements that will do that.

Senator SCHMITT. Do you think that you are out of the woods then operationally with respect to the F-100?

General BURKE. I think we have an engine that is operationally quite satisfactory. It has good performance with a few undesirable but tolerable operating limitations, an engine that is doing reasonably well in terms of durability and maintenance cost, but one that has the capability to do much better.

USE OF FUNDING PROVIDED IN FISCAL YEAR 1982 FOR ENGINES

Senator SCHMITT. Was there ever an effort taken to increase the thrust of the F-100 engine with the funding provided this year?

General BURKE. The company may have done some work—I expect they have, they can talk about it—but not at our initiative.

Senator SCHMITT. Not at your request or so far as you know with Air Force funds?

General BURKE. No.

Senator SCHMITT. There are apparently 17 different engines funded in the fiscal year 1982 aircraft engine component improvement program. You spent 47 percent of the $131 million on the F-100 engine.

Could you explain why nearly half the money is justified for that when there are 17 engines in the program?

General BURKE. The older engines we pretty well learned to live with. There might be a few dollars in there for the J-57's that we bought back in the 1950's. We pretty well understand that engine and have done all we can to it by now.

The reason that the bulk of it goes for the F-100 is that we are buying a lot of them, they are still new and there are still excellent opportunities to save us money by making those investments.

EXPLANATION OF 114 SPECIFIC TASKS IN CIP PROGRAM

Senator SCHMITT. In the 1982 budget justification for the CIP program for the F-100 engine, it was stated that this program contains over 114 specific tasks.

Will you explain for the record what that means and maybe provide us some idea of how serious each one of those 114 items might be?

General BURKE. Yes, sir, I will furnish that for the record.

[The information follows:]

CIP PROGRAM FOR THE F-100 ENGINE

The current F-100 engine Component Improvement Program (CIP) contract contains 102 tasks. These tasks are engineering, test, and management efforts to solve a particular engine problem or need. The majority of CIP tasks are engineering work, priority ranked, to design solutions to identified field needs. Test and management tasks then support these problem solutions. Tasks are grouped according to a work breakdown structure.

The actual number of tasks vary during the year. New problems must be worked and existing tasks may be deferred due to more critical efforts to be done within existing CIP resources. The priorities are assigned based primarily on safety. Two key parameters used in this process are class A mishaps and unscheduled engine removal rates (UER's). Tasks which will contribute most to reducing class A mishaps are ranked highest.

Of all the CIP tasks, there are only two tasks which are priority one (our most serious problems). The first is a redesign of hot air line insulation to prevent ignition of leaking fuel on exposed hot air line surfaces. This will eliminate a danger of F-16 nacelle fires which are potentially disastrous.

The second priority one task is an improved reliability pump controller. The new design will solve material fatigue failures in the controller which could lead to fuel leakage into the aircraft nacelle. This task will eliminate possible ground aborts and in-flight emergencies.

There are twenty-eight priority two tasks. These tasks are not as critical as priority one tasks, but still are very important to the operation of the engine. Some examples of priority two tasks are improved durability turbine airfoils and rotors, improved augmentor operation, improved durability combustor, elimination of compressor stator cracking, and backup control automatic start system.

The remaining tasks are of lower priority. While these do not have flight safety implications, they contribute to the solution of service revealed deficiencies, reduce the life cycle cost of the engine, and enhance the USAF maintenance capabilities for the engine. Included are development of repair procedures, redesign of components to extend life, testing, and management tasks.

FUTURE REQUIREMENT FOR INCREASED THRUST

Senator **Schmitt**. Mr. Chairman, I have a few more questions, but I will be happy to yield.

Senator **Stevens**. Senator Kasten.

Senator **Kasten**. General, I am also concerned about the thrust issue. The Air Force's own justification for the engine model derivative program says:

> Aircraft have historically increased in gross weight at the rate of two percent per year following their development. This historical factor resulting from roles and missions and more on-board equipment demands higher engine performance to be available to maintain system thrust to weight necessary to maintain weapon system performance.

Isn't it logical to assume that we are going to require a higher thrust engine in the relatively near future and if we are going to require it, would it not be wise to take steps now to insure a competitive environment for the future?

General **Burke**. I don't agree, sir. I don't see a need for a higher thrust engine for the F-15 or F-16 in the near future. We will be building a new fighter perhaps by 1993. I don't know whether that will use more or less thrust.

Senator **Kasten**. How do you explain the Air Force justification which cites the need for a higher engine thrust performance to maintain the weapons system performance?

General **Burke**. It is a generalization. It of course depends on how you began the program and what excess capability you had. We are fortunate we started both the F-15 and F-16 with an engine that provided very high performance, continues to provide high performance. We can contrast that with, say, the A-10 where we started that with a sort of minimum thrust and all of us would have like to have added to the thrust of that engine.

We do have an interesting anomaly in the F-16 cranked arrow wing, or sometimes an F-16XL, or sometimes an F-16E, but it is an F-16 with a much larger wing, longer fuselage, conformal weapons carriage and increased internal fuel and it is a heavier airplane than the current F-16. So there is growth and weight in that.

However, it is the belief of General Dynamics at this point, supported by the evaluations and wind tunnel work done by NASA, that the aircraft configuration will be so aerodynamically superior that the extra weight will be more than compensated for by the decreased drag and higher lift.

It is their judgment increased thrust will not be required for that and our analysis will support that.

SOLE SOURCE CONTRACTING

Senator **Kasten**. I think all of us are trying to reach the same goal which is basically to avoid sole source situations. I understand that engine development takes substantially longer than aircraft development does. Eventually, we are going to need higher thrust engines one way or another.

Why aren't we funding R&D efforts now to insure competition for the higher thrust engine in the future?

General **Burke**. We do have research and development effort in which both the engine companies participate, and it is a joint program with the Navy, looking for the next generation of fighter engines.

Senator **Kasten**. There is an April 21 memo from your office that I have had an opportunity to review. I am not sure of the circumstances surrounding the memo. But I am confused about the business split discussed in that April 21 memo on fighter engines.

You speak of competitive splits by aircraft type, that is, 60–40, 70–30. What are you talking about?

General **Burke**. Out of a competition, we might well not go 100 percent one way or the other. We might sustain that competition by giving 70 percent of the buy to the superior bid and 30 percent to the inferior bid with the idea of providing competition next year. In the next year's round you buy a new batch and they will compete again.

Senator **Kasten**. You basically accept the idea that we want to avoid sole source contracting and we want to continue at least with these two competitors?

General **Burke**. That is engraved in tablets of stone in my mind.

Senator **Kasten**. Mr. Chairman, I have additional questions I would like to submit for the record, but I have no further questions at this time.

Senator **Stevens**. General, I have a couple of questions and then we want to get to the other witnesses.

ESTABLISHING SPECIFIC REQUIREMENTS FOR NEW ENGINE

Have you established the specific requirement for this new engine so that you can really say to us now that there is a clear understanding of these requirements as you go into this competition?

General **Burke**. Yes, sir, we will flesh that out in great detail when we prepare the formal competition documents. We have a clear understanding of what we need and I think both contractors understand our view of it. Whether they agree with it or not is something they can comment on.

Senator **Stevens**. Competition is good in the private sector, no one is arguing that, but are you sure we need another engine?

General **Burke**. We are talking about spending $122 million to get the F–101 into a competitive position. We would spend that other money on the F–100 regardless. I think it is well worth $122 million to provide competition that holds out the prospect of several billion dollars in savings.

Senator **Stevens**. You are talking about dual source procurement in any event?

General **Burke**. Yes, sir. I think it is almost out of the question that we would go 100 percent to one unless somebody just collapsed.

SAVINGS OBTAINED IN DUAL SOURCE PROCUREMENT

Senator **Stevens**. On the basis of dual source procurement you still estimate substantial savings from the competition?

General **Burke**. Yes, sir, because the preponderance of savings I see are in reduced operation and support costs.

Senator **Stevens**. You are estimating cost of the development for the second engine at over $600 million, full-scale development, cost of GE development over $600 million?

General **Burke**. No, sir. I think it is $122 million.

Senator **Stevens**. How did you develop your savings estimates in terms of the concept of dual source procurement over the lifetime of the engine? We understand that you have a long-term savings projection?

General **Burke**. Yes.

Senator **Stevens**. You have to assume that you are going to have a rather permanent balance in your procurement in order to get that result?

General **Burke**. I estimated that we could achieve something on the order of ten percent savings in acquisition cost through the competitive process, and that is just my personal judgment and I don't know of any way to quantify that precisely.

We have done studies which show that if we can achieve our durability and maintainability goals we can reduce the cost of operating those engines over 20 years from about $8 billion down to about $4 billion and that is of course where the preponderance of savings would be in the maintenance cost.

Senator **Stevens**. You are assuming those savings on both engines?

General **Burke**. Yes, sir.

Senator **Stevens**. Are the savings equal on both engines? That is what bothers me. You have a winner and a loser. Then you bring in a dual source, 60-40 or whatever it is, 70-30, but you still say there are savings even though you are not going to have sole source procurement.

I am not advocating sole source. I am trying to find out how can you compute savings under those circumstances over the lifetime of the buy?

General **Burke**. We believe that the engine or engines, as a result of this competitive process, will be much less expensive to operate than the engines that we would have bought if we did not get into the competitive buying.

Senator **Schmitt**. Whichever supplier?

General **Burke**. Yes.

Senator **Schmitt**. Both engines will benefit from competition?

General **Burke**. That is right.

Senator **Stevens**. Any further questions of the Air Force?

Senator **Rudman**. I have two questions.

FAIR COMPETITION OF ENGINES A QUESTION

Some of the correspondence that we have received from the suppliers involved in this whole question, particularly the United Technologies correspondence, has been very concerned that true competition cannot result by competing their F-100 against the higher thrust F-101. Those are very nice words, but they have to be converted into some sort of facts.

So, I have a specific question for you. In terms of the test model you are going to develop, I have to assume that the acceleration specifications will have a range that will take into account that there are thrust differences. As pointed out both in your written testmony and in your oral testimony this morning, the installed thrust differences are a great deal less than the raw thrust differences, uninstalled.

My question is: Will your test specifications very specifically have a wide enough envelope that both of these engines can fairly compete so that Pratt & Whitney cannot say that they are being discriminated against? As you know, it is a logical assumption unless you have a specification broad enough.

General **Burke**. Absolutely. The last thing in the world we would wish to do is to structure this in a manner that would cause either of these great companies to be noncompetitive. It is in the best interest of us and the country to have both of these companies healthy and competitive, not only for this, but for any other fighter engine competition.

Senator **Rudman**. So that with respect to each of the specifications that would relate to thrust the envelope would be wide enough in that specification to allow both of these engines to meet that specification?

General **Burke**. Indeed.

GAO STUDY ON DEVELOPMENT OF F-101

Senator **Rudman**. For the second question I just want to quote back to you something that is kind of interesting. There was a GAO analysis back in 1980. We are always quoting the GAO around here, but, nobody is perfect or infallible, even them.

It says in that analysis it will cost $800 million for full-scale development of the F-101 DFE. It would take 12 to 14 years for the engine to attain normal maturity.

Would you like to comment on that this morning?

General **Burke**. I think they looked at the F-101 derivative fighter engine in isolation, which is incorrect. It is part of a family of engines. A lot of that work has already been done and is being done. It has the same core as the CFM-56 which is going into commercial service and KC-135. It has a lot of design approach commonality with the F-104 in the F-18. It is most closely related to its father, the F-101, which is now in development in the B-1 program.

Senator **Rudman**. There were some faulty assumptions in the study. Had the assumptions been correct I would expect the figures would be correct.

General **Burke**. Probably so.

Senator **Rudman**. What we are looking at now is something we will be able to make a decision on when; 18 months, 2 years?

General **Burke**. About 20 months I think.

Senator **Rudman**. Thank you, General Burke. Thank you, Mr. Chairman.

Senator **Andrews**. Mr. Chairman.

Senator **Stevens**. Gentlemen, I do want to get to the other witnesses now. If I can hold you to one question I will be happy to yield.

SPLITTING OF ENGINE BUY

Senator **Andrews**. Gentlemen, I have seen your April 21 message on fighter engine competition. You talk now about splitting the business, 60-40, 70-30. Maybe I am old fashioned, but it does not sound like competition to me.

Have you kind of preordained we are going through this whole thing and we are going to kind of split up the buy on something we have figured out ahead and the only question is: Who gets how much?

General **Burke**. To preordain what the Air Force will do in 1984 far exceeds my authority.

Senator **Andrews**. I would hate to try to preordain what Congress will do.

General **Burke**. What would be best for the country would be for these two fine companies to produce competitive bids that are both outstanding and very close to one another. On that basis then you can buy a larger number from one, a smaller number from the other, to reward the one who had done the better of the job although the other one has done quite well. Then you can come back next year and you can do it again and again and again.

So, you don't get one-time competition. You get 10 years of competition.

SUMMATION

Senator **Schmitt**. I won't take any more time except to say General Burke has said it exactly right. If I remember correctly, one of the Carlucci initiatives, or at least one of the Schmitt initiatives, for decreased cost in military procurement is to have not only competitive design phrases, but competitive procurement within various types of weapon systems as well as components such as engines.

I am truly encouraged by what I have heard this morning. I think we are going to have two engines that are very competitive in the reliability and maintainability area and that it will be a difficult decision. Having gone through it, you are going to be able to buy both engines with a great deal of confidence, maybe one more than the other.

The main thing I come back to is that I hope we also see at the end of this an engine which the pilot can use without concern, whether it is a F-101 or a F-100 behind him. The whole purpose of this exercise is to get an engine in our most advanced fighter aircraft that can do the job without the pilot having to be concerned about anything relative to his engine.

General **Burke**. I certainly agree with that.

Senator **Schmitt**. Thank you, Mr. Chairman.

PREPARED STATEMENT

Senator **Stevens**. Thank you very much, gentlemen.

Representative Gunderson of Wisconsin, who was unable to attend the hearing has submitted a prepared statement which will be inserted in the record at this point.

[The statement follows:]

Prepared Statement of Hon. Steve Gunderson, U.S. Representative From Wisconsin

Mr. Chairman and members of the subcommittee, I would first like to take this opportunity to thank you for permitting me to submit this prepared statement to you for inclusion in the record of today's hearing on the alternate fighter engine program.

In this time of fiscal austerity, we must seize every opportunity to save federal dollars when making large purchases on behalf of the federal government. This is particularly true in many of our purchases by the Department of Defense.

That's why I am gravely concerned about the fact that the legislation presently under consideration by your subcommittee provides development funding for only the General Electric F-101 higher thrust engine. I firmly believe that true competition in the manufacture of a higher thrust engine will not result unless Congress requires the Air Force to fairly fund competing engines of comparable thrust.

The current funding proposal for the upcoming fiscal year appears to be structured to bring about a preordained outcome in the development of a higher thrust engine by General Electric and Pratt-Whitney. This is not in the best interests of our country.

Clearly, it is advantageous for our government to have the opportunity to compare competing products so as to insure that we are, in fact, getting the best product for our money. This can only be accomplished if these two competing companies receive comparable government funding for development purposes.

I, therefore, respectfully recommend that this subcommittee reexamine the funding provided by the instant legislation to insure that the development of a higher thrust engine is truly competitive and we get the best engine for our money.

Again, I thank the subcommittee for this opportunity and for its consideration of my recommendation in this matter.

SUBMITTED QUESTIONS

Senator **Stevens**. We are going to submit some technical questions to you. We would appreciate it if you would respond for the record.

General **Burke**. We will get the answers back as quickly as possible.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

ADDITIONAL COMMITTEE QUESTIONS

ADVANTAGES AND DISADVANTAGES OF EACH ENGINE

QUESTION. Does Air Force consider these two engines as they now stand to be fully competitive? That is, is there a reasonably fair balance, in your judgement, between the advantages and disadvantages of each engine?

ANSWER. The engines, as they now stand, are not competitive; but we have proposed a program to insure they are competitive. The F100 engine lacks the durability, reliability, and operability demonstrated in the F101 Derivative Fighter Engine (DFE). Therefore, we are funding improvements in the F100 to allow it to compete; development of the 4000 cycle core and the Digital Electronic Engine Control (DEEC).

Similarly, the F101 DFE is a prototype engine while the F100 has been in production for some time. We have a full scale development program planned to productionize and qualify the F101 DFE. Since the two engines already have equivalent performance, our Alternate Fighter Engine program will make the two engines truly comparable and competitive.

DRAWBACK ON EACH ENGINE

QUESTION: Does either engine now have any single drawback so substantial that it places that engine at a competitive disadvantage?

ANSWER: No. We believe there are no substantial drawbacks to a fair competition. This assumes we qualify the F101 DFE and we continue to fund the F100 reliability and maintainability modifications as currently programmed.

DURABILITY PROBLEMS OF THE F100 ENGINE

QUESTION: Have the durability problems of the F100 been fully corrected, then? Are the two engines fully competitive now in the area of durability?

ANSWER: The Air Force has met the interim F100 durability goals set back in 1978/1979 when the problems were discovered. However, we are continuing to strive to improve the durability of the engine in order to reduce our cost of ownership. This is being accomplished in the Component Improvement Program (CIP).

At this point in time, the F100 and the F101 Derivative Fighter Engine (DFE) are not competitive in the area of durability. The fleet F100 engines are at 1350 tactical cycles. The current production F100 engine (since Mar 82) has an 1800 tactical cycle capability (yet to be validated in the field). It will not demonstrate 4000 cycles in the CIP until late CY 83 or early CY 84.

The F101 DFE has demonstrated 3898 tactical cycles; however, it is a prototype engine. The current full scale development program for the F101 DFE will "productionize" the engine and qualify it for production by late CY 83. At that time, the engines will be fully competitive.

SUSTAINABILITY OF THE ENGINES

QUESTION: How about sustainability? How do the two engines stack up as far as operation and maintenance costs go?

ANSWER: Both the improved F100 and the F101 DFE have greater sustainability over the present F100 engine. This is due to design improvements which result in less frequent maintenance actions as shown in the following engine overall removal rates.

Present F100	6.8 removals/1000 EFH
Improved F100	5.4 removals/1000 EFH
F101 DFE	3.9 removals/1000 EFH

This would be reflected in lower O & M costs per engine flying hour. It is important to note that the improved F100 and F101 DFE rates are estimates. Both of these engines are in the prototype phase and must be verified as production versions.

RELATIONSHIP OF ENGINE COMPETITION TO THE F-15E/F16E

QUESTION: You also make the statement, General Burke, that the current engine competition is not related to the F-15E or the F-16E. How can you make that assertion when it is clear these engines are indeed competing for those types of airframes?

ANSWER: The F101 DFE was started before the F-15E or F-16E. We had also considered F100 enhancement programs prior to those derivative aircraft programs. Based on an expanding force structure, we would be pursuing an engine competition if no F-15E or F-16E program existed. With an aircraft model change, the derivative aircraft offer obvious opportunities for possible engine competition, but the engine competition is a separate issue.

SPECIFIC REQUIREMENT FOR THE F101 DFE

QUESTION: Is it still true that the Air Force has not established a specific requirement for the F101 DFE? Can you make a full-scale development commitment without establishing a clear requirement for an engine?

ANSWER: As we have said, today's F100 meets our performance requirements as we know them. We do have a requirement for durable, reliable, operable fighter engines to support an expanding fighter fleet. We feel the best way to meet those needs is through competition. Without the F101 DFE, we will remain in a sole source position with the F100 into the nineties (over 20 years). The investment in the F101 DFE development is small compared to the possible savings that can be accrued through competition.

RE-COMPETE THE ENGINE SELECTION

QUESTION: Isn't it somewhat unusual to re-compete, in effect, the engine selection for an ongoing aircraft production program?

ANSWER. This is perhaps unusual, but certainly not unprecedented. Many commercial airline applications have the choice of several engines. With the potential of over 6000 engines supporting total F-15 and F-16 production, a competitive environment is very attractive, especially when one considers that the evolution of the F-15 and F-16 will span 30 years.

A major Department of Defense initiative has been to establish competitive environments in our systems acquisition process not just once, but throughout the life of a system. Such an approach ensures that the contractor stands behind his product, i.e., warranties, and provides the best product at the lowest cost.

F101 DFE PERFORMANCE IN COMBAT

QUESTION: The F101 DFE has not had actual experience in deployed aircraft. How confident can you be that it will perform as advertised and that its operating and support costs will be as low as testing experience indicates?

ANSWER: When the limited demonstration of the F101 DFE is coupled with the experience on the F101-GE-102 for the B-1 bomber and the CFM56 for the KC-135 re-engining, we are confident that the goals of the F101 DFE are achievable. Nevertheless, we will be taking the F101 DFE through full scale development to wring out a production ready version. Certainly, actual experience will reveal some problems. This will also be the case for an enhanced F100. Either engine will provide reduced operating and support costs.

DUAL SOURCE PROCUREMENT

QUESTION: If the alternate fighter engine competition were to result in dual source procurement, how would that affect the GE and Pratt and Whitney share of the military engine business?

ANSWER: There are many possible ways that the engine market could be split in a dual source environment. The best way to show this is to describe the two ends of the spectrum. A dual source situation would then fall somewhere between the two. The percentages shown consider USAF research & development, production, spare parts, and spare engines.

If we assume that the F100 engine remains in all F-15 and F-16 aircraft through the FY 83-87 planning cycle, the USAF business base split would be as follows (percent of business):

	FY 83	FY 84	FY 85	FY 86	FY 87
Pratt & Whitney Aircraft	67	46	52	58	70
General Electric Co.	33	54	48	42	30

If we assume that the current F100 engine remains in the F-15s, all FMS F-16s, and in USAF F-16s through FY 85, and the F101 Derivative Fighter Engine (DFE) is in the F-16 C/D/Es in FY 85 through FY 87, the split would become (percent of business):

	FY 83	FY 84	FY 85	FY 86	FY 87
Pratt & Whitney Aircraft	67	44	38	43	42
General Electric Co.	33	56	62	57	58

In reality, the actual business split would probably fall somewhere between these two situations.

BUDGET FOR THE F100 THRUST ENGINE

QUESTION: Last year Congress provided an additional $17.5 million to the Air Force for the specific purpose of developing increased thrust in the Pratt and Whitney F100 engine. When and how will you utilize the funding in the current fiscal year now that the funds have been released?

How much is included in the Air Force budget for F100 thrust increase work in FY 1983?

ANSWER: The Air Force is currently processing the documentation necessary to release the funds to the field so that they may be put on contract. These funds will be used to purchase hardware and to increase testing in order to reduce risk in the F100 Engine Model Derivative Program (EMDP) where the increased thrust F100 will be developed. The Air Force has not requested any money in FY 83 specifically for increasing the thrust of the F100 engine.

FUNDING FOR ADVANCED VERSIONS OF CURRENT ALTERNATE ENGINES

QUESTION: What funding, if any, have you budgeted in FY 83 for advanced versions of the current alternate engines, looking to improve power plants for the F-15s and F-16s?

ANSWER: We have budgeted $8 million in FY 83 for continuation of the F100 Engine Model Derivative Program. Other than the funds for the competitive versions of the F101 DFE and F100, no other FY 83 funds are budgeted for advanced versions of either engine.

PROGRAM FOR DEVELOPMENT OF NEW GENERATION OF JET ENGINES

QUESTION: What is your program currently for development of a new generation of jet engines? How do you plan to preserve the competitive balance you seek to establish under the current alternate engine program?

ANSWER: The USAF is taking the lead with the USN participating in the joint development of an Advanced Technology Engine for application to the USAF Advanced Tactical fighter (ATF) and the USN VFMX. The development will begin in FY 83 with USAF funding under the ATF program.

The engine development plan is based on the lessons learned from the F100 engine. It involves a phased program progressing from component development and test to prototype engine accelerated mission testing prior to the Full Scale Engineering Development (FSED) decision for the USAF ATF in late FY 87.

Although the alternate engine program and the Advanced Technology Engine (ATE) are unrelated programatically, competition for the ATE will be a natural extension of the competitive balance between General Electric and Pratt & Whitney established under the current alternate engine program. The ATE program will also allow the opportunity for other engine manufacturers to compete.

We anticipate that direct competition will be maintained in the ATE up to FSED where limited funding resources will preclude full scale development on more than one engine for the USAF Advanced Tactical Fighter. However, the ATE development will provide the basis for further FSED competition for the Navy's VFMX which will become operational approximately three years after the ATF.

IS HIGHER THRUST AN IMPORTANT FACTOR

QUESTION: General Burke, what if the planned flight competition between these two engines reveals that higher thrust is indeed an important factor, wouldn't that leave the lower thrust F100 out in the cold? Wouldn't that also tend to eliminate competition?

ANSWER: Flying the F-16XL with both engines is not a competition, rather it is a verification of our analysis that overall system performance is comparable with either engine. If thrust becomes a factor, we would certainly reconsider the proposed engine program. Increasing F100 or F101 DFE thrust would be evaluated against fighter aircraft requirements and prioritized against other Air Force requirements. We intend to ensure fair competition is maintained.

HIGHER THRUST VITAL TO F-16

QUESTION. Isn't higher thrust vital to the F-16 and its dual mission, particularly carrying heavy ordnance for ground attack missions? Isn't higher thrust also important for short runway operations, another mission requirement for the improved F-16?

ANSWER. Systems studies performed by the Air Force have indicated no requirement for higher thrust. We expect the F-16E to perform satisfactorily in the air-to-air and air-to-surface mission at current F100 thrust levels. Takeoff performance should also be adequate with current thrust levels. The increased aerodynamic efficiency of the cranked arrow wing allows a significantly higher takeoff gross weight with takeoff distance performance still considered quite acceptable.

INCREASED THRUST FOR F100 ENGINE

QUESTION: What would be the earliest, in your estimation, that increased thrust could be developed in the F100 if the Air Force were indeed to determine that higher thrust was essential?

ANSWER: With an adequate funding profile, a higher thrust F100 engine with improved durability and operability components could be ready to enter production in approximately four years. A higher thrust engine without the durability improvements could be available in as few as two years. However, this latter option is undesirable in light of past F100 durability problems.

DIFFERENCE IN INFRA-RED (IR) SIGNATURES

QUESTION: Is there a difference of any significance in the respective infra-red (IR) signatures for their plume emissions?

ANSWER: The overall IR signature is a total of the contribution of the engine hot parts, the plume, and the airframe. The F101 DFE has a mixed flow exhaust which reduces the plume contribution relative to the confluent flow of the F100. This is a difference in inherent design approach. Such a difference will be one of many evaluated under the competitive approach.

Under certain conditions of aspect and background, the F101 DFE can provide an improvement in survivability against IR. Alternatively in other conditions, the plume provides little contribution to the overall IR signature.

HOT SECTION DURABILITY

QUESTION: General Burke, you noted the F101 DFE has a hot section durability equivalent of 4,000 tactical cycles against 1,800 cycles for the F100. What do these rates equate to in terms of throttle excursions per flight hour?

ANSWER: Actual experience will vary by aircraft type and mission requirements at different bases; however, a good approximation is two cycles per flying hour. Thus, 4000 cycles is 2000 flying hours and 1800 cycles is 900 hours.

PROJECTION FOR FY 84 SPENDING ON F100 IMPROVEMENTS

QUESTION: Some $60.9 million is budgeted for the F100 in the Aircraft Engine Component Improvement Program for reliability/maintainability improvements. What is your projection for FY 1984 spending on F100 improvements? How does this compare to FY 1982 and FY 1981.

ANSWER: The FY 1984 program for the F100 Component Improvement Program (CIP) is $56 million, which is to be used for reliability and maintainability improvements. The F100 CIP was $59 million in FY 1982 and $56 million in FY 1981.

MAJOR ACCOMPLISHMENTS TO CORRECT F100 DEFICIENCIES

QUESTION: What have been the major accomplishments in this program to correct F100 deficiencies? What operational problems remained unresolved?

ANSWER: We have made significant progress toward correcting F100 engine deficiencies through the Component Improvement Program (CIP). These accomplishments may be categorized as improvements in operability, durability, and reliability.

In terms of operability, stall stagnation rates have been significantly reduced. The F-16's rates have fallen from an initial 1.38 per 1000 engine flight hours (EFH) to .12 with the current improvements. The F-15 rates went from a high of over 9 per 1000 EFH to its current .81. Further improvements are under development in CIP to lower these rates even more.

The F100 has grown and will continue to grow in durability. The core depot inspection interval has improved from 900 cycles to 1350 cycles with new production engines at 1800 cycles (yet to be verified in field use). CIP is developing a 4000 cycle core that will be tested in late 1983 or early 1984 with production incorporation expected in 1985.

Other durability accomplishments provided by CIP were fixes of the augmentor/nozzle seals, flaps, flameholders, and drive system. These fixes alone are expected to achieve life cycle cost (LCC) savings of approximately $600 million. Future CIP tasks will continue to improve LCC savings.

A major reliability problem area was the control system. In 1979, the overall control system was responsible for 27.6 percent of the unscheduled maintenance actions. This rate has been reduced to 14.5 percent in 1981. A particular problem was the unified fuel control. In 1978 it was responsible for 31 percent of the unscheduled engine removals. By 1980, this was reduced to 15.7 percent. CIP will continue control improvements with expected LCC savings of close to $1 billion.

There are two operational problems that we continue to work. There are throttle usage limitations in the upper left of the flight envelope (high and slow), especially using the afterburner. The Digital Electronic Engine Control (DEEC) development will significantly improve this problem. This should be available in FY 1984.

Some F100 engines have recently developed a visible smoke exhaust problem. Efforts to solve this problem in the short term have been unsuccessful. However, a new high durability combustor being developed in CIP shows great promise in eliminating the smoke. Production incorporation is expected in 1984.

REDUCING MAINTENANCE MANHOUR PER ENGINE FLIGHT HOUR

QUESTION: What success has been made in reducing the maintenance manhour per engine flight hour requirement for the F100 engine? What is your current goal? How does it compare with the F101?

ANSWER: The F100 Component Improvement Program (CIP) has made considerable progress in reducing maintenance manhours (mmh) per engine flight hour (EFH). The overall rate for F-15s improved from over 3 mmh per EFH to 1.8 in 1981. These improvements will save millions of dollars over the F-15 flying hour program.

The goals for 1983 were set by the program office in 1979. The F-16 goal is 2.8 mmh per EFH and the F-15 goal is 2.0 mmh per EFH. These goals will be met or exceeded in 1983, as indicated by field trends to date. The program office is now evaluating data in order to set new goals.

The F101 Derivative Fighter Engine (DFE) has a goal of 1.9 mmh per EFH. Field experience tends to indicate that this goal is optimistic. Since the F101 DFE is only a prototype, we will not know how realistic a goal this is until it enters production and field use.

EFFORTS TO IMPROVE F100 HOT SECTION DURABILITY

QUESTION: What efforts have been initiated to improve F100 hot section durability? At what cost?

ANSWER: The current production F100 core has a depot inspection return interval of 1800 hours. We are pursuing a 4000 cycle core in the Component Improvement Program (CIP). This program consists of an improved high pressure turbine rotor and airfoils, a new combustor, an improved bearing and rotor support, increased life rear compressor variable vane (RCVV) system, and an aerodynamic stability evaluation.

This program will cost approximately $35.7 million. In addition, $30 million is estimated to be required for engine testing and flight test support.

IMPROVE THE DURABILITY OF F100 ENGINE

QUESTION: A total of $10.3 million is requested for Engine Model Derivative Program. Part of these funds will be used to improve the durability of the F100 engine at an upgraded operating temperature (15 percent). When will this program be completed?

ANSWER: The F100 Engine Model Derivative Program (EMDP) is currently programmed to be completed during FY 1985.

PROJECTED TOTAL COST OF F100 EMDP

QUESTION. What is the projected cost of the F100 EMDP?

ANSWER. The projected total cost of the F100 Engine Model Derivative Program (EMDP) is approximately $90 million (then year dollars). The program began in FY 79 and will be completed in FY 85.

CORE IMPROVEMENTS FOR F100 EMDP

QUESTION: What kinds of core improvements are being considered for the F100 EMDP?

ANSWER: The F100 Engine Model Derivative Program (EMDP) engine configuration will include the increased life core. This core is expected to have a 4000 tactical cycle inspection interval and an 8000 tactical cycle life. The improved core components are primarily being developed in the USAF F100 Component Improvement Program (CIP), with the Pratt & Whitney Aircraft (PWA) Engineering Assistance to Production Systems (EAPS) contributing.

The improvements are contained in the compressor and mechanical components, the combustor, and the high pressure turbine. The compressor and mechanical components are being improved through material changes, some aerodynamic changes, and some redesigned components. The new rolled ring combustor incorporates better cooling, improved air inflow, and more efficient seals. The high pressure turbine incorporates improved first stage cooling, better seals, and increased life disks, blades, and vanes.

TACTICAL CYCLE RATE FOR F100 ENGINE

QUESTION: How long will it take Pratt & Whitney to get its tactical cycle rate (1800 cycles) up to the F101 DFE rate (3898)?

ANSWER: Pratt & Whitney will get the tactical cycle life of the F100 engine up to 4000 cycles by late CY 1983 or early CY 1984. This will be demonstrated in the Component Improvement Program (CIP) by means of accelerated mission test (AMT). Production incorporation is expected in CY 1985.

It also should be noted that although the F101 prototype engine has demonstrated 3898 cycles, we would need to thoroughly verify that capability in a production version of the engine.

DIGITAL ELECTRONIC ENGINE CONTROL SYSTEM FOR F100

QUESTION: Why does the F100 engine need a Digital Electronic Engine Control system? Why is this program funded in the Alternative Fighter Engine line rather than the Aircraft Engine Component Improvement or Engine Model Derivative program lines?

ANSWER: There are some significant advantages of the Digital Electronic Engine Control (DEEC) as compared to today's Electronic Engine Control (EEC)/Unified Fuel Control (UFC) combination. The DEEC eliminates the need to trim the engine, which saves fuel and maintenance manpower. It also improves the F100 engine operability by providing more reliable and precise engine response to throttle movements, especially during afterburner operation, throughout the flight envelope.

The DEEC has a built in Back-Up Control (BUC) rather than an add on to the engine as it is today. This results in a BUC that is fully capable for the full flight envelope. The DEEC also provides an expected reliability and maintainability improvement due to fewer parts and an overall less complicated control system. Finally, the DEEC will reduce troubleshooting time and accuracy through its built in test capability.

The DEEC development is funded in the Alternate Fighter Engine (AFE) Program because it represents a marked improvement in engine capability. It is also to be treated separately in the USAF operational logistics support system. The AFE program element was established for full scale development (FSD) of engines beyond current specifications. The DEEC FSD fits these criteria.

It would be inappropriate for the DEEC FSD to be in either the Component Improvement Program (CIP) or the Engine Model

Derivative Program (EMDP). CIP may not develop engine items that would improve upon specification values, which the DEEC does. EMDP is a prototype or demonstration program, not a program to qualify an engine or component for production which the DEEC FSD will do.

F101 DFE DIFFERS FROM B-1B

QUESTION: How does the F101 DFE differ from the F101 engine used for the B-1B?

ANSWER: The F101 Derivative Fighter Engine (DFE) differs from the F101-GE-102 engine used in the B-1B bomber in a number of areas. The DFE has a smaller three stage fan than the -102's two stage fan with corresponding changes in the low pressure turbine to drive it. This results in a lower airflow and bypass ratio for the DFE. The DFE weighs 3830 pounds versus the 4450 pounds for the -102 engine. Finally, the DFE's afterburner provides a denser fuel spray necessary for a fighter engine.

These changes result in different thrust levels for the two engines. The DFE produces 27,925 pounds maximum thrust and 16,650 pounds thrust at intermediate power. The -102 engine produces 30,780 pounds maximum thrust and 17,390 pounds thrust at intermediate power.

F-15E/F-16E FLYOFF IN DETERMINING CAPABILITY OF F101 DFE

QUESTION: F101 DFE performance projections are based on an Accelerated Mission Test. How important is the F-15E/F-16E flyoff in determining the capability of the F101 DFE?

ANSWER: The F-15E/F-16E comparative flight demonstration is not essential to our evaluation of the F101 DFE. However, it will provide some data in addition to that provided by the F101 DFE Full Scale Development program. This additional data will come from a portion of the F-16E flights.

FLIGHT TESTS OF F-15 AND F-16 WITH COMPETITIVE DERIVATIVE ENGINES

QUESTION: The Air Force has requested funding in FY 1983 to flight test the F-15E and F-16E. These aircraft are being considered as derivative fighter aircraft to perform deep strike and interdiction missions now performed by the F-4 and F-111. Won't both of these flight tests evaluate the performance of the F-15 and F-16 with competitive derivative engines?

ANSWER: No. The F101 Derivative Fighter Engine (DFE) will be evaluated only in the number two F-16E prototype, which will be delivered in October 1982. The number one F-16E prototype is compatible with the F100 Digital Electronic Engine Control (DEEC); however, a DEEC equipped engine will not be available for flight test until early 1983.

GROSS WEIGHT OF F-16E REQUIRE HIGH THRUST

QUESTION: Will the higher projected gross weight of the F-16E (48,000 pounds) require it to have an engine with higher thrust than is currently available in the F-16?

ANSWER: General Dynamics believes that the thrust of the F100 is adequate for the F-16E. USAF studies on today's F-16 have shown that in the critical parameter of aircraft system performance, overall installed engine performance of the F100 and F101 DFE is comparable. The increase in weight is offset by the more efficient aerodynamic configuration of the F-16E.

The reduction in relative drag for a given configuration is due to the semi-conformal carriage of weapons and the reduction of external fuel carriage requirements. By flying both of these engines in the F-16E prototypes, study results will be verified.

ENHANCED VERSION OF F-15 or F-16

QUESTION: Can we develop an enhanced version of the F-15 or F-16 without going to a higher thrust requirement?

ANSWER: Both McDonnell Douglas and General Dynamics believe that the thrust of the F100 is adequate for the current F-15 and F-16 and for the contemplated derivatives of these aircraft. USAF studies on today's F-15 and F-16 have shown that in the critical parameter of aircraft system performance, overall installed engine performance is comparable between the F100 and F101 DFE. By flying both of these engines in the F-16E prototypes, study results will be confirmed.

"CRANKED ARROW" WING OF F-16E

QUESTION: Will the "cranked arrow" wing of the F-16E mitigate the requirement for having an engine with higher thrust? Why?

ANSWER: The "cranked arrow" wing of the F-16E provides aerodynamic improvements over the F-16's basic wing design that could reduce the thrust requirement for a given level of performance. The aircraft weight increase is offset by a more efficient aerodynamic wing design that reduces drag and hence the relative thrust requirement.

QUESTIONS SUBMITTED BY SENATOR KASTEN

SPLIT MARKET FOR FIGHTER ENGINES

QUESTION: Wouldn't a split market for fighter engines complicate logistic support for fighter aircraft, particularly for those deployed overseas?

ANSWER: We currently have 8 different types of fighter engines in our inventory. An additional engine can be accommodated within the system and would not overly tax the logistics system. We do not anticipate mixing engines in a fighter wing. The overseas supported units would continue to be fully supported and we do not consider this to be a problem. Any increase in complexity would be more than offset by the advantages associated with competition and having an alternate source for fighter engines.

COSTS ASSOCIATED WITH SPLIT MARKET

QUESTION: Do you have any estimates of costs associated with the additional training, repair requirements and spare parts that would be required under such an arrangement? Wouldn't you expect it to add substantially to such costs?

ANSWER: We do not have estimates. However, the following should occur:

- Training costs may increase slightly due to the requirement to maintain two training programs.
- Repair requirements should be substantially less because of expected increased reliability and maintainability.
- Spare parts costs should be substantially less because of a lower frequency of repair and less depth of repair required.

CHANGES REQUIRED IN F100

QUESTION: With all that we've heard about durability and operability problems, isn't it true that changes required in the F100 are proceeding smoothly and on schedule?

ANSWER: Durability and operability improvements for the F100 engine are proceeding smoothly and on schedule. Durability improvements are accomplished in the F100 Component Improvement Program (CIP). We have steadily moved from the original 900 tactical cycle limit to 1350 cycles with new production engines now at 1800 cycles. We are on schedule to reach 4000 cycles in the CIP program by late CY 1983 or early CY 1984, with production incorporation by 1985.

Improved operability is a key objective of the F100 Engine Model Derivative Program (EMDP). We have seen promising operability improvements in testing to date, due to the Digital Electronic Engine Control (DEEC) and the advanced fuel management system (AFMS) for the augmentor. We are proceeding on schedule to complete the F100 EMDP in FY 1985. The DEEC full scale development will begin in late FY 1982 and be completed in FY 1984. This effort is also on schedule.

DURABILITY PROBLEMS IN F100

QUESTION: Isn't it fair to say that most of the durability problems in the F100 were not foreseeable, particularly since that engine passed the Air Force's required tests at the time?

ANSWER: Yes, most of the F100 durability problems were not foreseen. The engine was successfully qualified in 1973 against a duty cycle for a point intercept mission. Once we actually started flying, we found that we were experiencing more cycles per flying hour than we had originally planned for. This, coupled with our relatively new understanding (in 1973) of the effects of engines cycles on durability, led to the unexpected durability problems.

ACCELERATED MISSIONS TESTS

QUESTION: Isn't your current accelerated missions test based on experience with the F100 that wear on the engine is dependent on tactical cycles rather than just hours of flying?

ANSWER: Our current accelerated mission tests (AMT) are patterned after the F-16 mission. Our experience, particularly with modern engines such as the F100, has indicated that tactical cycles have a significant effect on engine durability and engine life. This, coupled with time at high engine temperatures (high power settings), are the key criteria duplicated in our AMTs. We now recognize that pure flying hours are not an effective measure of engine durability. The engine duty cycle is.

DURABILITY TESTS ON F101 DFE

QUESTION: What actual durability tests have been run on the F101 DFE? Will additional tests have to be run on production models of that engine?

ANSWER: During the prototype development of the F101 DFE, durability testing equivalent to nearly 2000 hours of F-16 operational use was accomplished. The durability testing was accomplished through Accelerated Mission Testing (AMT), running the exact same test cycle as is run on F100 engine in the F100 Component Improvement Program. The engine which accomplished the durability test was in good condition and will resume AMT testing this month (June '82). Additional tests are planned for the productionized version of the engine. A total of approximately 3000 hours equivalent operational use testing will be accomplished during 83 and 84.

QUESTIONS SUBMITTED BY SENATOR STENNIS

MAXIMUM COMPETITIVE ENVIRONMENT FOR ENGINES

QUESTION. General Burke, your statement highlights the spirit of competition in the acquisition of fighter engines with the goal of ensuring that the best engine is acquired at the lowest cost. Is it your opinion that the FY 1983 budget request and the funds included in the Five-Year Defense Program (FYDP) will provide for a maximum competitive environment?

ANSWER. Yes. We will have two qualified engines which meet our requirements. By capitalizing on that environment, I have high confidence we will achieve our goal.

F100 VS F101 DFE

QUESTION: There has been considerable concern over the past year or so relative to the difference in thrust capability between the F100 engine and the F101 DFE. The former is rated at about 23,000 pounds and the DFE at about 28,000 pounds. The Air Force has maintained that thrust is not at issue in the competition between the two engines. Yet the manufacturer of the F100 engine (Pratt & Whitney) claims the thrust difference makes the competition unfair. Would you comment on this issue and tell us why you believe the added thrust is not a competitive advantage for the F101 DFE?

What is the added weight of the F101 DFE, and does this added weight essentially offset its thrust advantage?

ANSWER: Comparison of the two engines should be based not on uninstalled thrust but on the performance of the aircraft in flight. Air Force systems studies have compared the engines installed in F-16s. Comparison parameters have included maneuverability, turn radius, acceleration time, and combat radius.

Each engine has its advantage dependent upon flight condition, stores configuration, mission, and parameter selected. In general, the performance differences are small; either engine will perform adequately. Thus, the competition should be based on other factors including durability, reliability, operability, life cycle cost and warranty.

The weight of the F101 DFE is 3830 lbs. and the competitive version of the F100 is 3171 lbs. or a difference of 659 lbs. The thrust-to-weight ratio is 7.3 for the F101 DFE and 7.5 for the F100. In addition, additional ballast weight may be required when the F101 DFE is installed in the F-16. The additional weight tends to reduce the maneuverability. In general, the F100 has an advantage in the upper left (low speed, high altitude) portion of the flight envelope while the F101 DFE has an advantage in the lower right (high speed, low altitude) portion.

PRESENT PLANS FOR COMPETITION

QUESTION: What are your present plans for competition between these two engines? What measures will be involved, and what time frame are we speaking of?

ANSWER: Since both engines meet our current performance requirements, the competition will be based on the criteria of life cycle cost, durability, reliability, maintainability, supportability, and operability. We anticipate extensive warranties with more contractor liability for their product. Although the details of a competition are still evolving, we do not expect that a competition could take place before late 1983 with deliveries in spring of 1986.

DELIVERY OF AIRCRAFT WITH COMPETITION ENGINES

QUESTION: When will aircraft be delivered with the new "competition" engines? In what fiscal year will you be budgeting funds for procurement of the aircraft with the new engine?

ANSWER: First aircraft deliveries with the competition winner engine are not expected prior to spring 1986. To meet those delivery dates, long lead funds will be required in FY 1984. Actual aircraft/engine procurement funds would be part of the FY 1985 budget.

DURABILITY PROBLEMS WITH F100 ENGINE

QUESTION: I believe the Air Force has experienced some durability problems with the F100 engine. Would you comment on these problems and tell us whether they have now been solved.
Did these problems affect combat readiness?
What was the cost impact of these problems?

ANSWER: The F100 engine experienced durability problems due to the high performance goals set for the engine, the state of the art technology contained in the engine, and our lack of understanding (in the early 1970s) of the effects of thermal cycles on engine life. These problems were primarily within the engine hot section and augmentor. We recognized these problems and solved them in the Component Improvement Program (CIP).

The F100 core hardware had an original limit of 900 cycles for depot return. This was later increased to 1350 cycles. New production engines are expected to have an inspection interval of 1800 cycles (must yet be verified through field operations). The current CIP goal is to achieve a 4000 cycle engine.

Other indicators also show that we have solved F100 durability problems. Overall F-15 engine maintenance manhours per engine flight hour went from 3 in 1976-1977 to 1.8 now. Unscheduled F-15 engine removal rates improved significantly from 15 per 1000 engine flight hours to 6 as of December 1981. While these figures indicate that we have solved our durability problems, we continue to strive for an even more durable engine.

Even though we experienced severe impacts from the F100 durability problems, we minimized the impact on combat readiness. The increased maintenance effort and higher demands for parts and engines were met by vigorous management actions by both the Air Force and Pratt & Whitney. This resulted in the F-15 flying hour program being maintained.

The durability problems had pushed up the cost of F-15 operations/maintenance to $710 per engine flight hour (EFH) (1982 dollars). This compares to the expected cost of $378 per EFH when we field the 4000 cycle F100. In addition, we spent significant amounts of CIP funds to solve the durability problems ($406 million between October 1973 and September 1980). Though expensive, we expect these efforts to result in significant savings.

FUNDS EXPENDED FOR F100 AND F101 DFE

QUESTION: Would you provide for the record a comparison of DOD funds that have been expended for the F100 engine program with the F101 Derivative Fighter Engine (DFE) program. Include development funds as well as component improvement and related items. Project the comparison to include future programmed DOD outlays.

ANSWER: Budgeted research and development funds (3600 appropriation) that have been and will be used for the F100 engine and F101 Derivative Fighter Engine (DFE) are as follow:

F100 Engine
($ in Millions)

	Prior Years	FY 82	FY 83	FY 84	FY 85
USN F100 R & D	280.0	-	-	-	-
F-15/F-16 F100 R&D	651.1	0.7	10.1	15.6	14.8
Component Improvement Program	462.9*	58.6	60.9	56.1	59.7
Engine Model Derivative Program	22.5	32.7	8.3	11.7	14.5
Alternate Fighter Engine Program	-	-	39.6	14.7	-
Total	1416.5	92.0	118.9	98.1	89.0

* Includes CIP funded by procurement (3010) funds prior to FY 1980.

F101 DFE
($ in Millions)

	Prior Years	FY 82	FY 83	FY 84	FY 85
Engine Model Derivative Program	115.2	.5	-	-	-
Alternate Fighter Engine Program	-	34.1	54.5	68.4	-
Total	115.2	34.6	54.5	68.4	-

COMMENT ON ENGINE TRIMMING

QUESTION: Comment on the difference between the two engines as regards engine trimming. It is my understanding that the F101 DFE does not require trimming. What is the significance of this in terms of manpower and dollar savings?

ANSWER: It is true that the F101 Derivative Fighter Engine (DFE) does not require trimming. The current F100 engine must be trimmed (fuel control adjustments for correct stall margin and thrust levels) every time a major component is replaced or during trouble shooting. The average F100 engine is trimmed approximately every 75 engine flight hours.

Trimming the F100 engine requires about 80 minutes running time, 8 maintenance manhours, and consumes 1000 gallons of fuel. The F100 Digital Electronic Engine Control (DEEC) will eliminate the need for trimming and its associated costs. The FY 1983 budget contains $39.6 million in the Alternate Fighter Engine Program for this effort.

DEVELOPMENT OF INCREASED-THRUST VERSION OF F100 ENGINE

QUESTION: The FY 1982 Defense Appropriations Act included funds for development of an increased-thrust version of the F100 engine. How is this development effort progressing, and what time frame are we speaking of when the increased thrust engine will be available?

ANSWER: The $17.5 million appropriated for the development of an increased thrust F100 engine was just released to the Air Force in May 1982. As a result, we are in the process of carrying out those actions necessary to release the funds to the field. The program office must then negotiate a contract for the proposed effort. We expect the contract to be signed and the work to begin before the end of the fiscal year.

Should a decision be made to fully develop an increased thrust F100 and if sufficient funds were made available, an increased thrust engine with the necessary durability improvements could be qualified in approximately four years.

AVAILABILITY OF HIGHER-THRUST F100 ENGINE

QUESTION: Would a more fair competition be available between the two engines if we waited until the higher-thrust version of the F100 engine is available?

Do you feel this delay would hamper combat readiness or serve to increase defense costs?

ANSWER: Actually, in regard to a fair competition and waiting for a higher thrust F100, just the opposite might occur. We are already programming funds to enhance the durability and operability of the F100 to bring it up to levels demonstrated by the F101 DFE. By also funding a higher thrust F100, the F100 performance could leap-frog overall F101 DFE installed performance. Thus, with an F101 DFE competing against an established production base, enhanced durability, enhanced operability, and enhanced performance the competitive status of the F101 DFE could be questionable.

We do not see a delay as hampering combat readiness; however, a delay would also delay gaining the cost advantages of a competition. We see the potential of introducing an engine into the fleet with half the operating costs of today's fleet. Delaying competition would also delay reducing support costs.

ANNUAL COST OF OPERATION OF F100/F101 DFE

QUESTION: Has the Air Force evaluated the annual cost of operation of the F100 engine with the cost projected for F101 DFE? What are your findings?

ANSWER: The factor that we use for cost of engine operation is dollars per engine flying hours (EFH). In FY 82 dollars, today's F100 operating cost is estimated $543 per EFH for budgetary purposes. We project that, under a competitive environment, an enhanced F100's operating and support cost would be $378 per EFH with the F101 DFE $256 per EFH.

AVERAGE MAINTENANCE COST FOR THE F100 ENGINE

QUESTION: What is the average maintenance cost per engine flight hour for the F100 engines in the F-15 and F-16 aircraft? This should include parts consumed and maintenance, labor cost.

ANSWER: The average maintenance costs for the F100 engine in the F-15 and F-16 is estimated to be $543.00 per engine flying hour (EFH) for budgeting purposes.

MAGNITUDE OF MARKET FOR JET AIRCRAFT ENGINES

QUESTION: What is the magnitude of the market for jet aircraft engines that we are looking at for procurement through the remainder of the century?

ANSWER: Depending upon approval of various programs, Air Force projections for the five year period from FY 1983 to FY 1987 range from 4350 to 5700 engines. Approximately 1000 engines per year is a rough estimate of Air Force engine procurement. When coupled with the requirements of the other services and the commercial market, these quantities certainly support our national resource of turbine engine manufacturing capability.

SUFFICIENT WORK FOR TWO U.S. ENGINE MANUFACTURERS

QUESTION: Is it your opinion that there is sufficient work for at least two United States manufacturers to remain viable and competitive throughout this period?

ANSWER: We estimate that by the early 1990's we will spend some $10B for fighter engines. With this size market we believe that sufficient work exists to sustain at least the two major manufacturers.

SINGLE JET ENGINE MANUFACTURER

QUESTION: Would it be your opinion that an industrial base supporting a single jet engine manufacturer would not be in the best interest of the Department of Defense?

ANSWER: Yes. From an industrial base perspective, we certainly need more than one jet engine manufacturer. We believe that competition results in a 10 to 15% program savings that should be aggressively pursued.

CAN COMPETITION SAVE THE AMERICAN TAXPAYER

QUESTION: Do you have any estimate of what you believe competition can save the American taxpayer through the end of the century?

ANSWER: Our projections indicate a $10 billion market. Even assuming only a 10% savings by competition we could potentially save $1 billion in procurement costs. Further, assuming improved reliability, durability and maintability are achieved through competition, a twenty year projection of operating and support costs shows potential savings approaching $4 billion in FY 82 dollars.

GOAL OF 4000 TACTICAL CYCLES FOR F-15 AND F-16 AIRCRAFT ENGINES

QUESTION: The Air Force has set a goal of 4000 tactical cycles for F-15 and F-16 aircraft engines. The F101 DFE has demonstrated this level of durability. What is your estimate of the time that it will take for the F100 to achieve this goal?

ANSWER: The F100 engine is expected to complete its first 4000 cycle accelerated mission test (AMT) in late CY 83 or early CY 84. This AMT will be conducted in the F100 Component Improvement Program (CIP). It should be noted that the F101 DFE prototype has demonstrated 3898 cycles through AMT. An additional AMT will begin the week of 14 June to accumulate additional cycles on the same engine.

COMMON LOGISTICS FOR ENGINES

QUESTION: The F101 DFE engine core was orginally designed for the B-1 and has a high percentage of commonality with the CFM-56 engine on the KC-135 RE aircraft. Would it be your opinion that the common logistics base for these engines would offer significant savings in the future?

ANSWER: The F101 DFE core would share common spares, technical data, support equipment, maintenance facilities as well as the Component Improvement Program with the F101-GE-102 and the F108 (CFM 56) engine. It would provide significant economies.

UNRESTRICTED USE OF THE FULL FLIGHT ENVELOPE

QUESTION: At present, do pilots of F-15 and F-16 aircraft have unrestricted use of the full flight envelope? If not, why? What would this restriction mean in terms of actual combat?

ANSWER: The pilot's handbook imposes the following constraints on afterburner operations during high altitude, low speed flight (above 30,000' and below approximately 180 kt's). The F-16 is limited to steady-state afterburner or afterburner cancellations and both F-15 and F-16 flight manuals note that afterburner mislights and blowouts are probable during throttle transients and possible during steady-state afterburner operations in this part of the flight envelope.

The occurrence of combat operations in this part of the envelope is not expected to be high. However, the need for close monitoring of engine operations will increase aircrew workload and divert their attention from more critical tasks.

ENLARGEMENT OF AIR INLET

QUESTION. There has been some concern that the F-16 aircraft air inlet is too small to permit the F101 DFE engine to achieve its maximum thrust. If so, and the F101 DFE is procured for the F-16, would the air inlet then be enlarged to enable the full thrust of the F101 DFE to be used?

ANSWER. A larger inlet would allow for better F101 DFE performance in the high altitude/slow speed regime of the F-16 flight envelope. Because of increased drag, a larger inlet would also reduce the maximum attainable speeds and reduce range. We see nothing which says a bigger inlet is needed, and currently have no plans to pursue a larger inlet.

NONDEPARTMENTAL WITNESSES

GENERAL ELECTRIC CORP.

STATEMENT OF JAMES N. KREBS, VICE PRESIDENT AND GENERAL MANAGER, MILITARY AND SMALL COMMERCIAL ENGINE OPERATIONS AIRCRAFT ENGINE BUSINESS GROUP, GENERAL ELECTRIC CORP.

ACCOMPANIED BY:

GEORGE H. WARD, GENERAL MANAGER, MILITARY ENGINE PROJECTS OPERATIONS, AIRCRAFT ENGINE BUSINESS GROUP

INTRODUCTION OF WITNESSES

Senator STEVENS. Now I will turn to General Electric, Mr. Krebs and Mr. Ward. I would like to hear both sides.

We have a meeting that starts at 11:30 and another one at 11:45. I cannot miss the second one. It deals with the urgent supplemental.

Gentlemen, with that understanding if you don't mind, what we are going to do is take the next 40 minutes and divide it literally in half. You have 20 minutes. Then we will call the others for 20 minutes. Then my colleagues will have questions for either one of you.

Is that agreeable?

Mr. KREBS. Yes, it is, Mr. Chairman.

I am James Krebs, vice president and general manager of the military engine operations, General Electric. I have spent all my 35-year career at GE in the engineering, development, and manufacture of jet engines, both the commercial and military lines.

With me is Mr. George Ward. George Ward is an engineer with 32 years' experience with GE. He has managed the F-101 programs for the last 16 years. That includes the bomber programs and the fighter programs as well.

COMPETITION FOR FIGHTER ENGINES

First I would like to thank you for the chance to talk about this unique opportunity for engine competition in the fighter business, competition for follow-on procurement of F-15's and F-16's through the period 1985 into the 1990's, competition for several thousands of engines.

This is the kind of competition that the Department of Defense always talks about, but rarely if ever can afford to set up and bring about. I think this is also the kind of competition that the Congress favors in the defense business. It is a classic good old American competition.

I might add that it is similar to the competition that exists in the wide-body commercial airplane business. You can buy 747's, 757's, 767's, DC-10's, KC-10's with engines from two, sometimes three companies. This is competition from which the aircraft companies benefit, and the airlines benefit. It drives the cost down. It improves the product. It improves the service.

It is a little painful for us competitors in this business to have this continuous competition, but that is the way the system works and I think it is beneficial overall.

How did it happen that we could have this unique opportunity for head-to-head production competition in the fighter engine business? There are a lot of factors and I have detailed these in our written statement. I do want to mention perhaps the most important one of all.

ALTERNATE ENGINE DEVELOPMENT

Congress saw the need for an alternate engine program to stimulate competition. Congress provided the funds for the limited development of the F-101 DFE starting in fiscal year 1979. Events have shown the wisdom of that decision. Our program has been successful. The dozens of Air Force and Navy and DOD and aircraft company experts who looked at our long-life hardware after the tests were very impressed. They had never seen anything like it.

The 27 pilots that flew 100 flights of the F-14 and F-16 were also very impressed. These successes put the F-101 DFE in a new light, not just a goad for Pratt & Whitney. Not just a backup for the F-100.

The Air Force now saw the opportunity for production competition as specified in Carlucci's initiatives. The Air Force plans to compete our engine against an improved model of the Pratt & Whitney engine with improved durability and a new control system as General Burke has indicated and compete in ongoing competition.

I would like to stress the words "ongoing competition" because this is not a single winner-take-all competition. This ongoing competition is expected to produce lower costs and provide better products. The forces of competition will achieve this. There is no doubt about that, as we see over and over again.

F-101 DFE DEVELOPMENT

We believe that the Government has already gotten its money's worth from that limited F-101 DFE development. Some benefits of the F-101 DFE competition are evident. The 4,000 TAC cycle hot section durability. Mr. Chairman, that is 2,000 to 2,500 mission hours' life for these airplanes. That is around 8 years' life in the military service. That is a new standard.

These turbine buckets are unique in the industry today—turbine buckets that can last 4,000 cycles. Incidentally, not just on the F-101 DFE, but also on our production F-404 engines where we now have a 3,000-cycle capability. And this one is a later experimental F-404 bucket that has already gone 4,300 cycles.

So it is not just a matter of luck. We have set out to achieve that standard and we have achieved it.

Also you see unrestricted throttle operation. That means exceptionally responsive engines, exceptionally stall-free engines, exceptionally stable engines, turbofans which for the first time have the characteristics of the old turbojet engines, such as the J-79 turbojet engines on the F-4 Phantom. These are new standards and we are very proud of them.

THRUST INEQUITABILITY

You heard claims that the planned Air Force competition is not equitable. Specifically Pratt & Whitney says that thrust is not equitable. The GE engine has more thrust. It has 28,000 pounds of thrust to 24,000 pounds of thrust for the F-100. Pratt & Whitney fears that they will lose because of this thrust difference and they said so publicly in their April 1 Wall Street Journal article on their fighter engine lobbying efforts.

No one can deny that thrust is important. It is very, very important for an airplane to have enough thrust. If the aircraft has all the thrust it needs, added thrust is really sort of an extra goody; it is superfluous. It is something you don't want to pay for. The Air Force says the 15's and 16's in the foreseeable models in the future have enough thrust.

General Dynamics says the airplanes have enough thrust. McDonnell-Douglas says the airplanes have enough thrust. In April 1981 we flew the F-101 DFE powered F-16 against the F-100 powered F-16. The pilots said that that was a standoff, a standoff in total aircraft performance.

Now some would point out that the reason that we didn't beat the F-100 in that engagement was because the F-101 operated behind the standard size inlet, 254-pound inlet, which restricted us by about 6 percent in airflow.

Some point out that you could easily increase the size of that inlet to 270 pounds, and indeed you could. But the change is rather small in the overall performance.

F-16 OPERATING ENVELOPE

I would like to have this one chart shown at this time. This is a chart showing the operating envelope in altitude and Mach number for the F-16. To the right of the black line, in other words at the higher speeds, the DFE has a slight advantage in aircraft performance, that is, in maneuverability, and acceleration.

To the left of that black line the F-100 has a slight advantage. Those advantages are slight. If we were to increase the inlet size to 270 pounds a second, the dotted line marks equal performance. It shows some improvement for GE operating at full airflow and thrust. Still it does not change the overall picture. The overall balance performance would be comparable.

Now why is this? Why is it that an engine with 4,000 pounds more thrust can't significantly out-perform the other? The answer lies in our greater weight. Our larger engine weighs 700 pounds more. Since the engines are at the rear of the airplane you have to add some ballast forward in the airplane to help balance it.

Let us say there is a 900-pound difference in the F-16 and in a twin-engine F-15 that difference is more like 2,000 pounds. That is a significant amount of weight. That is the reason that we can't have a significant performance advantage. Our weight outbalances our thrust advantage.

THRUST-TO-WEIGHT RATIO

So, the key engine parameter for fighter engine combat performance, Mr. Chairman, once the aircraft has enough thrust, is thrust-to-weight ratio, the number of pounds of thrust per each pound of weight.

General Electric's thrust-to-weight ratios are 5- to 7-percent lower than the F-100. Our F-101 DFE and F-404's are about 7½ thrust-to-weight ratio. There is close to 8 to 1 thrust to weight. The reason for this is because General Electric invested more weight in durability and in cost reduction. We did this as a deliberate design choice we decided not to go for the ultimate in performance, but to try to achieve these higher levels of durability and lower cost.

We think it was a wise choice. We think that choice has been vindicated by the success of the F-101 DFE at 4,000-hot-cycle demonstrations and likewise in the F-404.

F-100 ADVANTAGES

Now let us talk about something else besides thrust and thrust to weight. There are other competitive differences and these are not unfair either. For example, Pratt & Whitney had the advantage of having produced over 2,500 engines for the F-15's and F-16's. They are down the learning curve. They are at full rate production. This should give them an initial cost advantage over our early engines.

The F-100 has certain advantages in the field because the people are trained, because ground equipment is in place, and technical publications exist. But on the other hand General Electric's engine has demonstrated tremendous capabilities.

I have noted the better operating characteristics—The remarkable unrestricted throttle operations. The pilots can fly the aircraft without thinking about the engine. I have cited the new standards of durability which result in much lower operating cost both in parts consumed and in labor hours expended, which are much lower for every hour of service.

By the time you have 1,000 engines which operate 250 hours a year with several hundred dollars per hour cost saving, and operate that fleet over 10 to 15 years, you are up in the billions of dollars savings. These are big things we are talking about here.

Incidentally, we have already offered to the Air Force a very strong warranty which puts our money where our mouth is.

So, the F-100 and the F-101 DFE are different engines. As you say in politics, these candidates offer the voters a clear choice.

Incidentally, major differences between competing military products are not unusual in military procurement. In fact, I would say that they are more the norm. I could cite numerous examples, C-17, KC-135 reengining, the early F-16 and F-17 lightweight fighter competition and so forth.

The Air Force plans a very equitable competiton. I fail to see any reason why the Air Force would favor GE or Pratt & Whitney. Their criteria are durability, reliability, operability, and all elements of cost including life cycle cost—which is the total cost of ownership. This is what the Air Force wants. I think we have a very strong contender for this program.

Now I think it is important that we proceed. We shouldn't lose this opportunity to compete and we shouldn't delay this competition. We should go ahead for the F-15C's, F-15D's, the F-15E's the F-16C's, D's, and E's. The C's and D's soon, the E's later. Those are the known models. The E's are the ones in the future for an increased air-to-ground role.

So let us not lose this opportunity. We support the Air Force plan and we are anxious to compete.

I thank you.

[The statement of Mr. James N. Krebs follows:]

PREPARED STATEMENT OF JAMES N. KREBS

VICE PRESIDENT, GENERAL ELECTRIC COMPANY

GENERAL MANAGER MILITARY ENGINE OPERATIONS

SECTION 1

HISTORY

F101/B-1 -- In 1970, General Electric was selected following an extensive competition to develop the F101 engine for the B-1 bomber. Engine certification for flight was completed in 1974 followed by the first flight of the B-1 that same year. Certification for production was successfully achieved in 1976 and production initiated. The B-1 production program was cancelled in early 1977.

Research and Development of the B-1 resource was continued with emphasis on mission testing of the B-1 and durability/reliability improvement of the engine. This effort provided valuable information that has been incorporated into the production version of the B-1B.

Throughout these past 12 years of F101 development, some 70 plus sets of engine parts have been produced and tested for over 25,000 engine test hours. Flight experience has been gained in the four B-1 aircraft flown including extensive testing at low altitude with terrain following. Indicative of General Electric's performance, eight efficiency incentives or award fees have been granted by the USAF. The ruggedness and durability of the F101 DFE is directly related to the development of the F101 engine.

F101X -- In 1976, General Electric made a decision to demonstrate by engine test that a stall-free augmented turbofan could be built that would provide installed performance equal to F100 in the F-16 and better than the TF30 in the F-14. More importantly, however, this demonstrator engine would show substantial potential for reduced operating costs and thus be very competitive in overall cost of ownership or Life Cycle Costs.

Using corporate funds and IR&D funds, two F101X demonstrators were built and tested. The F101/B-1 core engine (high pressure compressor, combustor and high pressure turbine) were combined with a scale-up of fighter components from the successful F404/F-18 engine. The fan size selected was based upon installation considerations and thrust needed to offset the heavier weight. The resulting thrust to weight was not as attractive as the F100 but superior operability characteristics (stall/stagnation free) and a major reduction in support (parts and labor) were felt to make the F101X competitive. Engine testing was conducted in 1977 and 1978.

F101 DFE -- In 1978, the US Navy and Air Force responding to Congress, initiated a three-point program to establish competitive pressure on PWA to improve the F100 and TF30 engines. This program included: 1) CIP funding for both engines 2) Engine Model Derivative Program (EMDP) funding for the F101 DFE and growth F100, and 3), a funded study for an all new engine for the 1990's. General Electric responded with a fixed price proposal to build, test and fly the F101 DFE engine in both the F-16 and F-14 aircraft. This contract was awarded in early 1979.

General Electric is very proud of the F101 DFE accomplishments. An extremely challenging schedule has been met. The first engine was on test in less than a year and first flight in a single engine F-16 occurred in December 1980, less than two years from contract. Flying in the F-16 for 58 flights with 11 different pilots, the F101 DFE provided stall-free operation everywhere the aircraft could fly with no restrictions on the engine throttle control. This enabled the pilots to fly the aircraft and not the engine, certainly a new experience in the F-16. Culminating the F-16 flight test program was an air-to-air engagement with an F100 powered F-16. The results were a stand-off. Each airplane had advantages and disadvantages. The F101 DFE was some better at low level/high speed, whereas the F100 was better at higher altitudes and lower speeds. The higher thrust of the F101 DFE is offset by its heavier weight. This is especially pronounced in tight turns where "G" forces multiply the effect ... at 9 g's each pound becomes nine pounds.

In 44 flights in the Navy F-14, the F101 DFE again demonstrated outstanding operability characteristics. Throughout the flight envelope stall-stagnation free, unrestricted engine throttle operation was demonstrated.

Some sixteen pilots flew the F-14 and each was impressed with the operation of the engine. Unlike the F-16, the F101 DFE provided substantial improvement in mission performance for the F-14. The F-14 was designed to take the 28,000 lb. PWA F401 engine. The F401, which used the F100 core,was flown in the F-14 and completed 80% of its full development prior to termination of the program in 1973 after expenditures of $250M.

In some 2000 hours of testing to date the F101 DFE achieved a demonstration of 4000 TAC cycles. This level of durability exceeds F100 service limits by a factor of two. Especially important was engine performance which throughout these 4000 TAC cycles held within 1.5% on thrust and 3% on Specific Fuel Consumption and at no time were engine control adjustments required to maintain performance. Clearly this achievement represents "new standards" for augmented turbofan engine.

The outstanding results of the F101 DFE resulting from the initial contract were continued in FY'82 by Congress and the Air Force. $35M was furnished to continue limited development. Included in this effort are additional demonstrations of durability and modification of the engine outer diameter (no rotating parts are affected) to facilitate improved installation in the F-15. The F101 DFE is scheduled to fly in an improved version of the F-16 (F-16 XL) late this year.

SECTION II

FUNDING -- As stated earlier, General Electric seized the initiative to demonstrate the F101X as an alternative engine. A comparison of funding for the F101 DFE from FY'77 through FY'82 shows that the USAF has spent $115M via EMDP and GE spent $35M of GE money. There is $35M funding for the FY'82 transition phase. In a parallel effort GE received $160M of Continued Engineering Development for the F101/B-1, for a total of $349M. From available public information, it is our understanding that during this same period the F100 CIP was $338 and the F100 EMDP was $37M. The F100 received CIP prior to FY'77 totaling some $144M. In addition the F401 development was $250M prior to cancellation.

FY83 BUDGET -- The FY'83 USAF budget requests funding of $94.1M to initiate full scale engineering development (FSED) of both the F101 DFE and improved F100. This Alternate Engine Program will provide certification of two comparable engines for production competition. The DoD plans for increased procurement of F-15, F-16, F-14 aircraft reveal a $10B+ engine market extending into the 1990's. The F-16E and F-15E derivative aircraft, coupled with continued stretch of the Advanced Tactical Fighter are strong indications that continued improvements of F-15, F-16 aircraft will be stressed, thus making the need for competition and alternate engines more necessary.

FUNDING FAIRNESS -- In order to qualify engines that by 1984 have the characteristics that the USAF requires for its future fighters, there is a significant development effort required on both F100 and F101 DFE engines. Several funding sources are being used for the F100. CIP is being used to raise the engine life from the current 1800 TAC cycles to the required 4000 TAC cycles. It is also being used to improve the overall reliability of the F100. As a significant part of this reliability effort, there is a plan to introduce a new gear-driven fuel pump. This effort will be supplemented by funds on the Alternate Engine line. These funds will be used to develop a control system whose intent is to provide a throttle restriction-free envelope and reduce the number of stalls currently experienced.

DFE funding comes from the alternate fighter engine line. This funding is to complete the qualification of a "productionized" version of the engine used so successfully in the flight test program. This version of the engine retains the basic life, performance and operability parameters of the flight test engine but changes the method of manufacture to be compatible with high rate production. Funding levels for the next three years are:

ITEM	PURPOSE	ENGINE	DOLLARS IN MILLIONS FY 83	 FY 84	 FY 85	COMMENTS
CIP	Improve Durability/ Fix Problems	F100	61	57	61	Continuous effort since 1973
	New Fuel Pump	F100	10	14	10	Special Effort
Alternate Engine (FSED)	F15/F16 Competition	F100 II (+DEEC)	40	15	--	Both engines complete FSED in 1984
		F101 DFE	54	68	--	
Competitive Engine Total (Near Term Competition)		PWA F100	111	86	71	= $268
		GE F101 DFE	54	68	--	= $122M

SECTION III

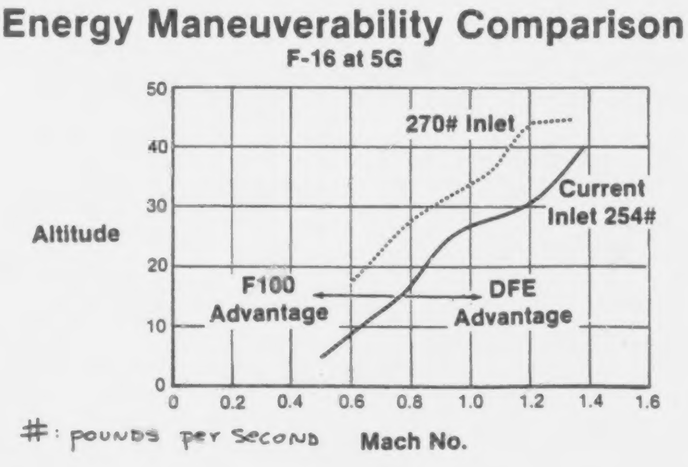
FAIRNESS OF COMPETITION -- There has been much discussion of the fairness of the USAF plans to compete engines for the F-15 and F-16 pitting a higher thrust F101 DFE against a lower thrust but improved F100. Before addressing the various aspects of fairness, it is important to consider the USAF's need.

NEED - The F100 has been in production since 1972 -- some ten years. Initial plans were to produce approximately 1800 engines for the F-15 program. Today's production has exceeded that quantity, the F-16 has been added (approximately 2500 have been delivered) and the prospects show quantities exceeding 7000 total engines. Early durability and operability problems of the F100 led to higher than expected maintenance costs. The Air Force must provide improved operability, durability, and life in order to be able to afford the cost of flying these aircraft. Competition will bring this about. The F101 DFE has demonstrated that J79 levels of support cost can be achieved and even bettered.

Asymmetries do exist in this competition and in my experience exist in every competition. Examining these in detail will show that they do not favor GE.

THRUST - First let's look at thrust. The USAF has established the competitors as the 24,000 lb. F100 3 (DEEC) vs. the 27,400 lb. F101 DFE to compete for the F-15/F-16. Important to fighter aircraft performance is thrust to weight. The F100 at 3100 lbs. vs. F101 DFE at 3800 lbs. enjoys a significant advantage of almost 8 to 1 vs. just over 7 to 1 in thrust to weight. The higher thrust level of the F101 DFE is required to overcome the weight added for durability and reliability.

The F101 DFE performance is constrained at certain flight conditions in the F-16 by the size of the engine inlet. The USAF has no plans to change the inlet but even if it were changed the effect on performance is quite small. A plot of flight test data comparing the F100 and F101 DFE shows the areas of advantage. To this has been added the effect of a larger inlet.



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Since flight test data does not support a case for higher thrust for competition, what then, are the issues. The growth F100 (1130) currently funded under EMDP provided some 15% more thrust. It also requires a delay beyond the current plan for competition. Each year competition is delayed another $1B is committed to the F100 program. General Electric would also need improved thrust or substantially reduced weight to remain competitive. It would seem logical to fund both growth engines with EMDP so that competition can be continued should higher thrust become a requirement in the future.

PROCUREMENT COST -- The asymmetry of procurement cost definitely favors the F100. With initial production in late 1984 or early 1985 some 3000 F100 engines will have been produced. The F101 DFE start-up costs (tooling) and beginning of the learning curve costs are higher than the F100.

SUPPORT COST -- The F101 DFE has demonstrated significant advantages in durability and life - partly due to investing more weight and partly through GE design detail - which equate to lower parts and maintenance labor hours. This advantage must offset the procurement cost disadvantage for the F101 DFE to be competitive.

OPERABILITY -- The F101 DFE has demonstrated in the F-16 and F-14 excellent throttle response, no stagnation stall, stable afterburner and no throttle restrictions. F100 changes funded, by the USAF, are yet to be demonstrated.

IN-SERVICE EXPERIENCE -- Both competitors know fighter engine needs and requirements based upon many years of supplying these equipments. The F100 has, however, over 1M flying hours plus training and other logistic systems learning. Introduction of the F101/B-1B system into the USAF system will offset the PWA advantage somewhat. It does, however, remain an advantage for the F100.

FLIGHT TEST -- Competition is planned for the F-16 and F-15. Both competitors have flown in the F-16 and will fly in the F-16E. The F101 DFE has not flown in the F-15. The USAF says this is not necessary. We feel it is desirable. Flying in the twin engine F-14 did provide valuable data applicable to the F-15. We don't consider this lack of F-15 flight test experience to be unfair.

SUMMARY -- Each competitor has advantages as well as disadvantages. This is true in most competitions whether it be for military or commercial procurement, aerospace or consumer products. In respect to commercial aircraft the builder generally offers the aircraft with a choice of engines which provide some differences in performance, operating characteristics, price and operating economics. The USAF has structured a plan for competition to address their need, namely durability, reliability and operability. The facts (flight data - requirements - field experience - previously stated concerns) support their plan. General Electric supports the plan and is ready to compete.

SECTION IV

BENEFITS OF COMPETITION -- Competition is traditionally the way the consumer makes the producer of goods or services responsive to the consumers' needs. It took the severe pressure of an alternate source of reliable high gas mileage cars to make the domestic auto industry change from its traditional large, comfortable, but high fuel consumption products. Competition forced the production of K and X cars so that the consumer had a choice of a product he wanted. The aircraft engine industry has seen a similar change in the commercial aircraft market. In the 50's and 60's, an airliner came out with one manufacturer's engine, and all further sales had the same combination. However, in the 70's the aircraft manufacturers and the airlines realized that by qualifying two and sometimes three engine manufacturers' products in each aircraft, they could have the benefits of a competition on every airline buy. This competition is believed to have reduced the engine price to the customer by 10 to 15% with the added benefit that the after-sales support is improved by the competitive pressures for the next buy.

The afterburning turbofan was introduced into military service in the 60's. The flexibility and high thrust to weight of this form of power plant was ideally suited to meeting a range of weapon system missions. Unfortunately, this type of engine immediately ran into two very serious problems. The afterburner was unreliable at low speed, high altitude with the result that there were so many engine stalls (temporary and occasionally permanent losses of power) and burner blow outs that restrictions had to be placed on the operation of the throttle. The other problem was one of hot section life. The engine cycle demands that very high temperatures are used in the combustor and turbine. The fighter/attack mission also requires a lot of engine accelerations and decelerations. This combination produced a severe life problem, and hence, frequent overhauls with resultant high operating costs. Initial testing, however, of the DFE has shown that operation without throttle restriction is possible as demonstrated in the F-16 and F-14 flight tests. Furthermore, engine life of 4000 TAC cycles (approximately 8 years of operation) has been demonstrated. These standards have also been demonstrated on the F404 engine where there is an even greater base of data. The problems are, therefore, soluble and it is interesting to note that by the end of 1984 when both the F100 and F101 DFE will be qualified, the F100 also is planned to have 4000 TAC cycle life and be free of throttle restrictions. Competition is, therefore, fulfilling its planned role of driving the product to meet the user needs.

The initial engine acquisition costs have been only the tip of the iceberg in the total life cycle costs of many engine buys in the last two decades. Operating costs in the region of $600-1000 per engine flying hour have been common. As a result the Air Force has been forced to pay the equivalent of the cost of one new engine in spare parts and labor every eight years and with weapon systems of this type currently having life spans of the order of thirty years, this means for every engine that is installed another three must be budgeted over the life of the weapon system. In addition the shorter the overhaul life of the engine, the greater the number of spare engines that must be bought to keep the aircraft fleet operating while repairs and overhauls are carried out. When the cost of these spare engines becomes prohibitive, then insufficient spares are bought and the readiness of the fighter wings is at risk. It is absolutely essential, therefore, that in studying the relative cost benefits of competing engines that total life cycle costs (LCC) are considered since the bulk of the total cost is in operating not acquisition costs. Reduction in operating cost is the place where maximum gains can be made. Reduction by a factor of three from current levels are well within the design capability of the industry. The existence of real competition can be used to make this happen. Furthermore, the existence of competition provides a climate where effective warranties can be obtain to insure that life cycle cost projections are realistic and obtainable. Savings of at least $400 per flying hour maintenance costs are achievable. Savings of this type soon mount up to really substantial numbers. For example, current plans call for the purchase of at least a 1000 more F-16's. These aircraft typically fly 250 hours per year. Hence, after ten years of operation $1 Billion could be saved on maintenance costs alone. Spare parts provide very profitable business and the worse an engine performs, the better that business will be. There must, therefore, be a counter balance to this situation and continuous repeated competitions are the most effective means to prevent poor performance leading to increased profits.

SECTION V

PRACTICALITY OF COMPETITION -- The benefits in terms of reduced costs, better product support and improved capability are clear. Despite this dual sources for engines are a rarity in the military. The reason for this is the high cost of new engine development (up to 1 billion dollars in combination of R&D and CIP is not unusual). However, in the case of the F100 and F101 DFE competition there are special circumstances which allow a dual source situation to be created.

First, the market is large. A build-up to 40 or 44 tactical air wings requires the procurement of large numbers of additional models of F-15 and F-16 aircraft. Approximately 3000 more engines in the F100/F101 DFE thrust class will be required. This is a market of $10B for engines and spares and, hence, is large enough that major savings are possible through competition.

The next requirement to gain benefit from competition is that the R&D costs to qualify the competing engines are significantly less than the potential savings. In this case it is possible to qualify either engine at reasonable cost. In the case of the F101 DFE the most expensive part of the engine development is complete since the core of the engine is identical to that of the B-1B engine entering production in 1983. The remainder of the engine is modeled on the highly successful F404 fighter engine.

The F101 B-1B, F101 DFE, F404 and CFM56 engines have common technology in design and materials. As a result, experience is being accumulated at a significant rate. The B-1B engine will qualify in '83, the F404 is in squadron service and the CFM56 will have flown 3 million hours by the time production DFE's could enter service in 1985. This solid experience based on true production and service life is the cornerstone on which the DFE is founded. The core represents about one-third of the engine acquisition costs but will account for more than half of the maintenance cost.

This extensive background whose sunk costs are over $1 Billion is supported by the outstanding results of the DFE to date. The engine operated without throttle restrictions in both aircraft. The endurance engine showed a hot section life capability in excess of 4000 TAC cycles. Emphasis now will be to change the method of producing the engines so that efficient, high rate production is possible, and to insure that the configuration is such that the engine fits in the F-15 and F-16.

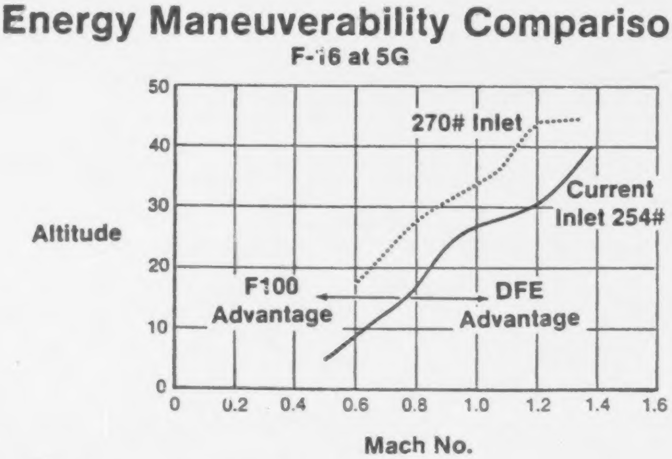
A.

THRUST WEIGHT AND INLET SIZING

There has been considerable discussion on the issue of engine thrust and weight differences between the competing engines. In order to put this issue into perspective, it is necessary to look at those factors that affect system performance.

- In engines of this type, thrust at the mid-range of subsonic values drops to 50% of its sea level value by 25,000 ft. and to 20% by 40,000 ft.
- Thrust to compensate for increased weight remains constant with altitude.
- Inlets cannot be sized to exactly match engine flow requirements at all speeds. In the type of aircraft under discussion the engine needs more flow than the inlet can provide at high altitude low speed and cannot take all the air the inlet provides at high speed, low level.

Since the F100 and F101 DFE have different thrust and weight parameters the three factors mentioned above interact differently producing performance differences on the two aircraft engine combinations. At high altitude and low speeds, the lighter weight of the F100 provides superior performance. In the lower right of the flight envelope the higher thrust of the DFE provides superior performance.



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The figure shows that the line dividing the areas of relative advantage for either engine essentially splits the flight map in two. Also shown on this figure is the impact of matching the DFE with a bigger inlet. Some improvement in capability in the upper left hand corner is noted while sacrificing some capability in the lower right. The interaction of thrust, weight and inlet size can be seen in the following table which looks at three parameters for operation at 30,000 ft. at a moderate g level.

Mach No.		.8	.9	1.2
Thrust Required to Overcome Weight Penalty of DFE		2700#	1600#	800#
F101 DFE Thrust Relative to F100	Current Inlet	-200#	+100#	+1800#
	Large Inlet	+1000#	+1600#	+2000#

The Air Force has no plans to change the inlet. As can be seen, there is no reason to believe that the inlet size is significant relative to the competition. Current Air Force projections show both systems do the job, hence, performance is not considered a significant issue when compared to Life Cycle Cost aircraft readiness and the early introduction of a competitive environment.

B.

4000 TAC CYCLE HOT SECTION

Engine maintenance costs are strongly influenced by the period between hot section inspection/overhauls. In order to minimize these costs GE determined from their logistic cost models that a maintenance interval of no less than 1500 hours would be required to keep a depot work load to a minimum low level. In order to ensure no less than 1500 hours a design requirement of 2000 hours was set as the internal requirement. Detailed examination of current fighter engine usage shows that 2 TAC cycles an hour is typical of fighter engine usage. Hence, 4000 TAC cycles became GE's requirement for hot section life. (At this time period the Military Qualification Test (MQT) required less than 250 TAC cycles.)

In order to meet this type of requirement, considerable changes in both design and test philosophy were necessary. Increased cooling air was provided to all hot section parts and trades in specific fuel consumption were necessary to achieve this. In addition to avoid excessive deterioration caused by frequent transients, thermal matching of rotors, blades and casings received careful attention. Solution of this problem caused some weight penalty but once again, it was considered to be beneficial to the overall system. Obviously, the old MQT was inadequate as a method of test and so the engine was subjected to a series of accelerated mission tests in which the frequent engine transients of real fighter operations were simulated. Before the actual DFE 4000 TAC cycle demonstration, a great deal of experience was gathered from similar tests on F404 and F101 engines. (The F101 has a high cyclic content in its test requirement because of the requirement for terrain following in the B-1B.)

The DFE hot section which completed 4000 TAC cycles is once more on test in Evendale and the ultimate life capability of these engine parts will be determined over the course of the next two months.

C.

OPERATING COST VERIFICATION

The planned hot section life for the post 1984 fighter engines is 4000 TAC cycles. In order to assess the capability of the engines, it is essential to run them both through Accelerated Mission Tests (AMT). Although a great deal of useful experience is obviously achieved as operational experience is gained, it takes a long time for the mature life characteristics to become known. For example, at the time an operational fleet of fighter engines accumulates one million hours the average age of each engine will be in the 600-700 hour range (TF34 - 690 Hrs., F100 - 620 Hrs. at 1,000,000 flight hours). At this time only a handful of engines will have reached over a thousand hours, i.e., the oldest engines would have about 2000 TAC cycles with the average being 1200-1400. Engines with a true 4000 TAC cycle capability would only experience a few premature parts failures at the time the fleet cumulative hours reach a million, hence, AMT testing is the only technique we can use to project mature engine maintenance loads and spares requirements.

Experience from J79 and other USAF engines (i.e., TF41, F100) AMT show that good correlations can be obtained particularly on those hot section parts which are the major contributors to engine operating costs.

D.

CHANGES FROM CURRENT CONFIGURATION

Both engines (F100 and F101 DFE) will have changes from their current configurations by the time they are qualified in 1984.

F101 DFE CHANGES: In order to be compatible with the F-15 aircraft as well as F-16 and F-14, the production engine has been slimmed in radius in certain critical locations by up to half an inch. This "slimline" configuration does not change the rotating machinery control system, exhaust nozzle parts or main engine frames from the flight test engines. It will be tested early in 1983. The only other significant change planned from the flight test engines is to change the rotor material from R'95 to Inco 718. This change caused by a processing problem in R'95 has already been accomplished and demonstrated in F404 and CFM56 engines without any impact on their life/durability/reliability characteristics. The F101/B-1B engine is also being changed and it will be certified in 1983. The F101/B-1B engine core is identical to the F101 DFE core. There is no reason to believe the DFE experience will be different. Additionally, an F101 DFE engine with In 718 rotors will be AMT tested this fall. Other changes in the engine relate to choice of manufacturing technique to enable the engine to be produced efficiently in large numbers. In these cases, form and function do not change, just the method of manufacture.

E.

FIGHTER ENGINE CHARACTERISTICS

OPERABILITY-DURABILITY-RELIABILITY-PERFORMANCE RETENTION

These are the factors that become important in operational service. They are extremely critical to the battlefield commander and to the pilot flying combat. They don't give the pilot more energy maneuverability, more range, more turn rate, more guns/ammunition, but they give him the confidence that his weapon will perform the tasks they were designed for.

Operability is the capability to put the throttle where you want it and know that the engine will respond. A pilot's effectiveness in combat is significantly reduced if he has to check flight instruments for altitude and Mach number before moving the throttle, and engine instruments after moving the throttle. He needs to concentrate on putting the fire power on the target and the engine should not restrict his actions. Furthermore, uncertainty as to whether an engine should or should not have responded to throttle movements leads to heavy and frequently unnecessary maintenance loads.

The F101 DFE has demonstrated a full envelope augmentor and unrestricted throttle operation in factory, AEDC/NAPC altitude, and F-14 and F-16 flight testing. The pilots have been overwhelmingly impressed with the engine. The current F100 exhibits some operating instabilities requiring care in use of the throttle in some portions of the flight envelope. The correction of this deficiency is one of the primary reasons for the large development effort for the F100 DEEC.

The durability of an engine determines the length of time an engine can remain in the aircraft before being removed to replace major components such as combustors or turbines that have been worn out.

Reliability is the characteristic of an engine that describes the ability to operate without malfunctions between periodic maintenance. Control or accessory component failures, stalls, augmentor blow outs or mislights all fall in this category.

The battlefield commander must have high mission reliability in his fighters to effectively wage his campaign. War time operations require high sorties rates. As engine life increases the probability of requiring maintenance effort in a period of intense operational activity decreases. The DFE has stressed that in its designs, and has currently demonstrated a life equivalent to 8 years of operation (4000 TAC cycles) without significant loss of performance. The current engine has less than half this life capability and in addition suffers from performance deterioration. It must have its life/reliability improved significantly in order to reduce the current excessive maintenance load. This is why the F100 CIP program has been running at an average of $50M-60M a year for a considerable period of time.

CONCLUDING REMARKS

Senator STEVENS. Thank you very much. Mr. Ward, did you have a statement?

Mr. WARD. No, sir.

Senator STEVENS. Thank you very much. With your approval, Mr. Krebs, we will call the Pratt & Whitney people up and we will have questions of both of you after they have finished their statement.

Mr. Carlson, Mr. McAbee, and Mr. DeSantis.

PRATT & WHITNEY

STATEMENT OF ROBERT J. CARLSON, PRESIDENT, PRATT & WHITNEY

ACCOMPANIED BY:

FRANK W. McABEE, PRESIDENT, GOVERNMENT PRODUCTS DIVISION

LEONARD L. DeSANTIS, SENIOR VICE PRESIDENT, CUSTOMER REQUIREMENTS

INTRODUCTION OF ASSOCIATES

Mr. CARLSON. Good morning, Chairman Stevens, honored members of the U.S. Senate, General Burke, Mr. Krebs, ladies and gentlemen in the audience.

To my left is Mr. McAbee who is president of Pratt & Whitney's military engine business. To his left is Mr. DeSantis who is the senior vice president of Pratt & Whitney's military engine business.

Protocol at this point would suggest that the next remarks express my pleasure in being here today.

PRATT & WHITNEY/AIR FORCE DISPUTE

Unfortunately, that's not the case. While it is always an honor to appear before a committee of the U.S. Senate, it certainly is without pleasure I find myself today publicly airing some very deep differences that exist between my company, Pratt & Whitney, and its single most important customer, the U.S. Air Force, a customer whose decisions control not only the destiny of this company, but thousands of jobs to tens of thousands of jobs, and the future of an engine technology base second to none in the world.

Pratt & Whitney makes the F-100 engine that today powers the F-15 and F-16 fighters. Those aircraft, and their respective derivatives, have a future sales base through 1992 projected to be 4,400 engines worth approximately $10 billion in 1983 dollars.

That engine is this company's only military engine business of consequence for the decade ahead.

COMPETITIVE ENGINES WITH PRATT & WHITNEY

We do not have the good fortune to be supplying engines for the F-18, projected to be 3,700 engines worth $7 billion.

We do not have the good fortune to be supplying the engines to the U.S. Air Force for the B-1 bomber, the advanced technology bomber, the C-5N, the reengined KC-135, or the KC-10 tankers.

This business is worth, respectively, 480 engines, amounting to $1.5 billion for the B-1. Four hundred engines worth another $1.5 billion for the advanced technology bomber. Two hundred and forty engines worth $500 million for the C-5N. Fourteen hundred engines worth $1.250 billion for the KC-135. One hundred and seventy engines worth $500 million for the KC-10 tankers.

We do not have the good fortune to have the T-700 helicopter engine contract, numbering 5,400 engines, worth $1.5 billion.

Finally, we do not have the good fortune to be supplying gas turbine engines for destroyer and frigate application forecasted to be 300 requirements worth nearly $1 billion in the same timeframe.

While there are 400 engines projected to be left for the F-14 worth $1 billion and there are some commercial engines going into the 707 AWACS, the fact remains we, Pratt & Whitney, have 1 military engine of consequence to build in the next 10 years and it is the F-100. We sit on a one-legged milk stool, without the good fortune of an eight-legged one. In that light, our alarm and concern about the equity of a so-called competition for a portion of the single leg that supports us should be easily understood.

It is the U.S. Air Force's expressed intent to recompete the engine in the current vintage F-15's and F-16's and to compete the engine for application in the derivative versions of the F-15 and F-16 known as the E versions and to interest the U.S. Navy in adopting the same engine choice for the reengining and/or follow-on buys of the F-14 Navy fighter.

ENGINE RECOMPETITION

At this point, let me make it crystal clear, I totally support the competitive process and while I think that what is good for the goose should be equally good for the gander, and if recompeting the F-100 is good, then recompeting a lot of other engine awards must also be good. That is not why I am before you today. I am not here to ask for the funds and Air Force intitiatives necessary to recompete the eight legs of the other chap's milk stool.

I am here because I am naive enough to believe that if it is the intent of this committee, the intent of the Department of Defense, and the Congress and most importantly, the intent of the U.S. Air Force to conduct a recompetition of the fighter engine selection, or a new competition for a derivative fighter powerplant, then it must also be their intent that such a competition be squeaky clean, be totally equitable in every respect, and be completely devoid of any cloud that would suggest such competition may have a predetermined outcome.

That unfortunately is not the case. Clouds do hang over the so-called competition. Clouds that suggest the percentage split of future business may already have been determined. The very label with which the competition has been christened by the customer suggests inequity among participants. The contest has been labeled a dissimilar competition.

I don't know what that term suggests to this committee, but to the man in the street I offer to you, it suggests the Dallas Cowboys versus Public School 2037, Mohammed Ali in his prime versus Sugar Ray Leonard, or the F-15 versus the P-38.

I appear before you today with a very distinct advantage over many people in this room. I have a limited knowledge of aircraft turbine engines. I spent 50 years in rural America first as a farm boy, and then extolling the virture of increased thrust and the added productivity it provided in farm equipment.

Now the reason that is an advantage is that when a technical discussion begins the participants have to reduce that discussion to a vocabulary I can comprehend, a vocabulary devoid of puzzling and impossible-to-decipher acronyms, a vocabulary devoid of terms such as Rene 95 or Inco 718.

On that kind of an intellectual plane white means white, black means black, competition means competition, equitability means equal.

Now I have learned a few things about gas turbine engines.

As an example, I do know the Air Force specifications that were laid out for the F-100 engine when we competed for it in 1969 and 1970 called out for it to have a cycle life of 1,765 idle to maximum power cycles which I will refer to as full thermal cycle. The F-100 met that specification as well as every other spec laid out at that time. It passed what then was billed by the Air Force as the most demanding qualification tests to which a gas turbine ever was subjected.

TACTICAL AIR COMMAND CYCLE

I also know that a tactical air command cycle, know as a TAC cycle was never even invented until 1975 when the pilots began to control the aircraft and its evasive and attack maneuvers with not only the stick, but also the throttle.

Because of these throttle transients employed in achieving the increased combat performance, the term TAC cycle was defined to measure and record the additional throttle movement within a full thermal cycle.

Thus a TAC cycle puts stress on hot section blades and vanes four times faster than a thermal cycle. That means that the 1,765 thermal cycles called for in the original engine competition translate to approximately 440 TAC cycles and today the objective is an engine with nearly tenfold that original spec life, and engine of 4,000 TAC cycles, a virtual lifetime core.

F-100 ENGINE ACCOMPLISHMENTS

I know the F-100 opened up a whole new vista of performance that today gives our F-15 and F-16 pilots the winning edge in combat; a vista of performance totally unthought of, unplanned and unbelievable until the engine delivered its performance boundary breakthrough, and greatly enhanced the combat capability of the F-15.

I know, as you do, the engine pushed the boundaries of gas turbine technology and associated metallurgical technology far beyond anything the world has experienced.

I also know that the critical mass of gas turbine brainpower and metallurgical brainpower present in Pratt & Whitney solved the durability problems associated with this enormous and unforseen performance breakthrough the F-100 provided.

Today, that same critical mass of talent is proceeding, on schedule, with Air Force funding, to give you, on schedule, in 1985, an engine with a proven life of 4,000 TAC cycles, nearly 10 times the original life we were asked to provide when we won.

That translates to 16,000 thermal cycles of life as compared with what where called for in the Air Force specs called for when the competition was won, 1,750 thermal cycles.

When that lifetime engine goes into its first F-15 or F-16, we will also probably give it the same precedent-setting no cost warranty we gave the Air Force in 1981 on F-100 engines, a warranty we invented and gave without being asked to do so to solidly demonstrate our commitment to excellence and our confidence in the durability of our engine. No one else has seen fit to offer such a warranty to the Air Force or the Navy and I often wonder why.

With appropriate humility, I would like to suggest I think it behooves Congress, the Department to Defense, and the U.S. Air Force to handle with great care, the critical mass of talent represented by Pratt & Whitney that has served this country so well for so long, and today rests on that one-legged milk stool.

A new engine is much like a new born baby. When, first out of the womb and polished up, it sure looks nice and in most cases, fortunately everything works. You nurse it along for a while, then you finally turn it loose, let it stretch its legs, let it seek its boundaries, and it plays Little League, and stars at the seventh grade prom, and then, all of a sudden, it reaches puberty and all hell breaks loose, and you wonder if it will ever mature.

At times you are pressed to the wall and the thought enters your mind more than once, let's toss this kid out, he is ruining this family's reputation, he is more trouble than he is worth.

However, parental responsibility and love and commitment generally prevail, outside help is solicited, parental sacrifices are made, you invest money in what you hope is his future, you straighten his teeth, heal his scratches and bruises, nurse him through measles and mumps and acne, and all of a sudden, one day, the kid has grown up.

He is reliable, he is dependable, he works hard, he gets the job done and all of a sudden you no longer have to defend him, beat him about the ears, impose a curfew on him or ground him for poor performance. He has become a winner.

After four children I have observed that turning point to be about 20 years for the child, while wisdom far more experienced than mine says that age in a military gas turbine engine is about 1 million hours.

At 1.2 million hours of service use, the F-100 has reached that point, it is a winner, and as it moves through its twenties and thirties and fourties, it is going to get better and better and better every day, every year.

Now let's move to the issues at hand.

Those issues are not whether to recompete or not to recompete.

Those issues are not issues of should we compete or not compete the powerplant for the E fighters.

Those issues are not whether Pratt can provide a core with a cycle life 10 times the original Air Force specifications.

ISSUES REGARDING F-100

The issues today remain simply:

First, is the competition, as currently being structured, a totally equitable competition without a preordained result; and

Second, is thrust an issue?

I don't know if thrust is an issue, but let me tell you what I do not know and maybe together we can reach a consensus.

The Air Force has stated and testified on numerous occasions the F-101 DFE program has never been pursued because of a requirement for increased thrust.

Pursuant of thrust or the lack of such pursuit is one matter, but it is May 1982 now, several years since the F-101 pursuit began and I guess it is very fortunate added thrust capability is there because it is going to be needed.

F-16E MULTIROLE FIGHTER

Like every aircraft program in history, the F-16 has grown, desirably so, and on July 2, 1982, only 38 days away, the F-16E will be rolled out in Fort Worth, Tex.

Let's take a look at this new multirole fighter with its hoped-for awesome air-to-ground as well as air-to-air capability.

The current F-16 is an air-to-air fighter with a 24,000-pound thrust F-100 engine. Its air inlet lets in 254 pounds of air a second to feed the combustor and cool its turbine. This aircraft in the F-16C air-to-ground version has a maximum gross weight of 37,500 pounds and requires 21 seconds of takeoff roll and 3,550 feet of runway on a 103° day at sea level.

The multirole, air-to-air, air-to-ground F-16E has larger wings and an extended fuselage. It is a substantially larger aircraft, an aircraft that, despite its lower wing loading from its cranked arrow design, will not perform in the same manner as today's F-16 throughout the flight envelope, if you equip it with an engine of identical thrust.

This aircraft has a maximum gross weight of 48,000 pounds in the air-to-ground configuration, a weight gain of 10,500 pounds or over 5 tons more than today's F-16's.

Its air inlet feeds the engine a maximum of 254 pounds of air a second, permitting the current F-100 to produce its maximum thrust of 24,000 pounds but restricting the maximum thrust of the F-101 DFE to 28,000 pounds of thrust.

With the F-100 engine, the F-16E at maximum takeoff gross weight requires 5,200 feet of runway on a 103° day at sea level, and

32 seconds takeoff roll. With the F-101 DFE, takeoff distance is reduced by 900 feet and the roll time is decreased by 5 seconds.

These are very critical seconds and critical length when you must get the aircraft into the air. I really believe the user will opt for the best performance at the time of choice.

I'm sure it appears to you, as it does to me, that there may be some significant differences in performance between the F-16E with the F-100 and the F-16E with the F-101 DFE—if the F-100 is installed without increasing its thrust. Let's take a look at the proposed F-101 DFE installed in the F-16E and breathing through the same 254-pounds-per-second inlet, where it has been alleged the thrust differential is inconsequential to performance.

The Air Force has testified that in the F-16, in a stationary mode at sea level, the F-101 DFE has 20,200 pounds of thrust and the F-100 has 19,400 pounds of thrust.

I totally concur with that statement by the Air Force, and would only make the observation I don't believe fighter aircraft and engines are selected on how well they perform at sea level in a stationary mode.

The Air Force has also stated this very close sea level relationship of the two thrust levels represented varies across the flight envelope, but that their studies show the overall installed engine performance is comparable.

Let's take a look at what actually does happen to that thrust level as we move from sea level to the mach numbers critical in an air-to-ground combat environment.

Here is the sea level installed performance, the top line is the F-101 DFE, the lower line is the F-100, both using the current 254-pounds-per-second inlet.

Now let's expand our look at the flight envelope and take the aircraft to .6 mach number, which is the low end of the traditional air-to-ground combat regime. Notice as we enter the air-to-ground combat envelope how the thrust levels of the F-101 DFE have increased over the F-100, the difference has now grown to 2,400 pounds of thrust and I don't call that differential comparable thrust.

Instead, it is a very impressive and very desirable attribute the Air Force needs to avail itself of in this new fighter. That is a thrust increase over the F-100 of 10 percent.

I submit to you that the thrust level differential shown here is extremely significant and further that it represents total inequity in the competition being structured today for engines in this aircraft. All of these thrust levels are attained with the standard air inlet module that permits a maximum of 254 pounds per second of air into that engine.

Now, what happens if you just open up that inlet a little bit so it can let pass 270 pounds of air per second, then what happens to thrust and performance in the F-16E?

Well, take a look. All of a sudden you have got a very impressive F-16E, one that generates 29,000 pounds of thrust at 0.6 mach, 4,500 pounds more than the F-100.

Up to now we have compared the 16E in an air-to-ground configuration. Now let's look at what happens in an air-to-air configuration when you provide the 270-pound-per-second inlet.

In this mode, the F-101 DFE has a very significant increase in acceleration time over the F-16E equipped with the F-100 engine. In fact, it is 33 percent quicker in the air-to-air regime, 60 seconds compared to 80 seconds, a very substantial improvement in acceleration time.

At this power level the F-16E takes off faster, uses less runway, and has a better turn rate, than the E has with the F-100 or the F-101 DFE and a 254-pounds-per-second inlet.

You can hardly see the difference between a 254-pounds-per-second inlet and a 270-pounds-per-second inlet. It might be interesting that the F-14 has today an inlet permitting 270-pounds-per-second aiflow.

Certainly it appears to be more than mere coincidence that the Air Force is energetically encouraging the Navy to show interest in the F-101 DFE as the powerplant for reengining any future F-14.

Gentlemen, I think it is a fair assumption that work is underway today or may be even completed to fabricate a 270-pound inlet module for the F-16E. It is not only easy to fabricate, it is easy to install.

Possibly by now my paranoia over thrust and the lack of equitability of this so-called competition is a bit better understood.

I don't think thrust is an issue in this competition, I think thrust is the issue and any decision by the Air Force not to opt for the kind of performance you can get with the thrust level represented by the F-101 and a 270-pound inlet, I suggest to you would border on irresponsibility for the Air Force to recommend and for Congress to support.

Gentlemen, this committee last year in the fiscal year 1982 appropriations report said:

> If a higher thrust requirement does appear, sufficient funding and time must be provided to develop the F-100 to a thrust level equal to the F-101 DFE before full-scale development. This is necessary to provide true competition and to assure equitable options are available to the department.

Gentlemen, I submit to you that that thrust requirement exists today and is needed and will be used.

Pratt & Whitney only requests adequate funding to insure equitability in thrust and timing and the assurance the results of the competition are not predetermined nor preordained.

Thank you very much.

[The charts accompanying the statement follow:]

PREPARED STATEMENT OF ROBERT J. CARLSON
PRESIDENT

PRATT & WHITNEY

Introduction

This document is submitted for the record to support testimony by Robert J. Carlson, President of Pratt & Whitney and Executive Vice President of United Technologies Corporation, given on May 25, 1982.

It addresses four issues that are relevant to those hearings. First, a review of the F100 engine program, which has provided the United States Air Force with an engine that makes the F-15 and F-16 fighters second to none.

Second, what Pratt & Whitney and the USAF are doing to continually improve the F100 engine to insure that its operability and durability meet the newly defined requirements and expectations of the USAF.

Third, what Pratt & Whitney perceives to be the key issue for these hearings: a lack of symmetry in engine competitions, including views on competing and/or recompeting engine programs, dissimilar competitions with the predetermination of the winner, and the disparity in development funding.

Finally, several recommendations that will serve the best interests of both the United States Government agencies that use jet engines and the industry that provides them.

F100 Program

From the outset, the FX -- original designation for the present-day F-15 -- was designed for air superiority. The F-15 program objective was clearly stated during source selection in 1969: "Develop and acquire an advanced tactical fighter aircraft capable of gaining and maintaining air superiority, through air-to-air combat."

Since the best fighter engine of that time was designed around mid-1950's technology, a new, advanced-technology engine with a high thrust-to-weight ratio was required for the FX.

In August 1968, the Air Force awarded competitive 18-month Initial Engine Development Programs to General Electric and Pratt & Whitney calling for each to build and test demonstrator engines. Each competitor was awarded about $50 million to ensure an equitable competition.

In 1970, after an exhaustive evaluation of each contractor's design, construction and testing of experimental engines, and an evaluation of proposals, Pratt & Whitney won the contract to develop the F100 engine for the F-15.

The F-15 made its first flight on schedule in July 1972, and proceeded to accomplish all program milestones and flight demonstration points by the end of 1972, in accordance with the program plan. Pratt & Whitney was advised by the Air Force that the F-15 flight test program was one of the most successful fighter development programs ever conducted.

The aircraft met all of its performance requirements. There were no aircraft losses.

While the flight test program continued, the engine passed, in 1973, the most severe Qualification Test ever required to that time of an aircraft engine. The F-15/F100 combination entered operational service at Luke Air Force Base, Arizona in November 1974--a date established five years earlier. Since that time, 12 operational activations have been made on a world-wide basis--all on schedule.

In 1974, the Air Force initiated a competitive procurement for a new Air Combat Fighter. The F100 engine was selected to power the YF-16 entry in this fly-off competition and in 1975, the F-16/F100 combination was declared the winner.

To date, in F-15 and F-16 aircraft, the F100 engine has accumulated approximately 1.2 million hours of operational fighter service in the U.S. Air Force and the air forces of eight of our allies. Two additional allies will become operational in the near future.

This broad range of operational experience provides lessons-learned which cannot be obtained on engine test stands alone, and has permitted incorporation of a steady stream of improvements into the F100.

In 1976 and 1977 the Air Force and Pratt & Whitney, and the aircraft manufacturers, McDonnell Aircraft (F-15) and General Dynamics (F-16), conducted intensive engineering investigations into the basic causes of compressor anomalies. The problem was isolated and for the first time resolved.

Three specific engineering solutions were developed and evaluated in engine test chambers and substantiated in F-15 flight tests. Two of these solutions were incorporated into F-15 engines, and all three solutions were incorporated into F-16 engines.

A review of the history of rate of such anomalies (Figure 1) shows a ten-fold reduction in the F-15. Today, F-15 rates are approximately 1.0 per 1000 engine flight hours (EFH) or one event every three years, and F-16 rates are 0.1 per 1000 EFH or one event about every 28 years per airplane.

The design requirements laid down for the F100 engine in 1968-70 were based on the best forecast of how the F-15 would be used at that time. But as fighter operations began, it became apparent that new tactics were available as a result of the high thrust-to-weight combination of the F-15 and F100 engine.

These new tactics were adopted for the F-15 and F-16 and give our fighter pilots a major advantage over all potential enemy aircraft. These new tactics, however, accumulate engine cycles much faster per flight hour than anticipated in the original design requirements. As a result, turbine life in early engines was less than anticipated.

Through the program of continuing component improvement (CIP), turbine life has grown from 600 cycles in 1978 to 1,800 cycles today. (Fighter engine hot section life is measured in the number of power excursions, named TAC cycles). To meet newly identified Air Force durability requirements, Pratt & Whitney has design and testing under way to increase turbine life to 4,000 cycles. This work is on schedule for incorporation into 1985 production engines.

The steady increase in engine durability and Pratt & Whitney's confidence in its product, set the stage for the industry's first fighter engine warranties. Four different warranties are in effect for the new F100's being shipped today.

The first is a supply warranty against defects in material and workmanship which lasts for eight months after first installation of the engine. The second is an extended engine service warranty, and covers the engine for 200 hours operation or two years. If the engine becomes unserviceable during this time period, for any reason, it will be returned to service by Pratt & Whitney at no additional cost. The third warranty covers the high-pressure turbine for 1,350 cycles of operation or five years. The fourth warranty, just going into effect, covers fan disks for 3,000 cycles of operation or ten years.

The turbine and fan disk warranties represent a new commitment on the part of an engine manufacturer in that they involve no increase in engine price.

F100 Engine Model Derivative Program (EMDP)

In the mid-1970's Pratt & Whitney initiated efforts to expand the F100 engine program beyond those activities carried out under the Component Improvement Program (CIP). The intent was to insure that the engine benefited from the introduction of new technologies developed since the initial design was completed in the late 1960's.

The timing of this effort allowed Pratt & Whitney to take advantage of developments in solid state electronics and introduce a Digital Electronic Engine Control (DEEC) that promised to improve operability dramatically, while reducing initial cost and maintenance costs.

In addition, advancements in augmentor (afterburner) combustion and control technology and the newly-developed single crystal turbine blade material promised to enhance engine operability and durability. Following engine studies and an evaluation of future fighter aircraft requirements, a program was defined with the following objectives:

- Improved Engine Operability - With particular regard to providing 100 percent reliable augmentor transient operation at the high-altitude, low-speed extremes of the F-15 and F-16 flight envelopes.
- Improved Durability - With emphasis on combustor and turbine (hot section) blade life, when subjected to the cyclic throttle operating mode developed by fighter pilots flying the high performance F-15 and F-16 aircraft.
- Performance Margin - Approximately 15 percent thrust increase relative to the F100 engine then in production, to provide for aircraft combat performance improvement to counter an ever-improving enemy threat and to provide for the growth in aircraft weight/drag that historically has occurred as new models of successful fighter aircraft are introduced with expanded mission capabilities.

After initial design and component testing, sponsored by Pratt & Whitney, the Air Force undertook the F100 Engine Model Derivative Program (EMDP) to incorporate the Digital Electronic Engine Control (DEEC) and advanced augmentor components into the F100 production engine configuration.

The purpose of this program was to conduct a limited development activity to identify the benefits these advanced components could provide to the basic F100 engine.

In 1981, the F100 EMDP was expanded to encompass additional new technologies, including the single crystal turbine airfoils and an increased airflow fan, to provide performance margin for future growth in thrust or further improvements in engine durability by operating below maximum temperature capability.

The expanded EMDP, along with a concurrent company sponsored effort, form the basis for the current, combined USAF/P&W

activity whose objective is to accumulate the engineering data necessary to demonstrate improved operability, durability, and performance margin.

This combined program will include flight testing of prototype engines in an F-15 aircraft in the spring of 1983. Other component design and testing could lead to a production engine configuration in 1985. Operability, durability, and performance data from testing this configuration on the current schedule will be available for a Full Scale Engineering Development (FSED) decision in 1985. Figure 2 shows the relationship of the F100 EMDP Evaluation phase to the current production F100 engine, and the introduction of the growth versions of the F-15 and F-16 fighters.

Since its inception in 1976 under Pratt & Whitney sponsorship, the overall Advanced F100 Program has been funded in the amount of $146 million. Of this, $117 million has been provided by Pratt & Whitney discretionary funds and $29 million, by the EMDP contract.

The current USAF plan will provide a total of $61 million to Pratt & Whitney under the EMDP contract through FY 1985. Of this amount, $31 million, including the earlier $29 million, is under contract and the remaining $30 million is in negotiation.

There are no plans to fund the follow-on Full Scale Engine Development (FSED) effort that would lead to production qualification of the F100 EMDP configuration.

Rather, the Air Force plan for future development of the F100 engine includes only modifying the configuration to incorporate the Digital Electronic Engine Control (from EMDP), a new main fuel pump and an improved durability core.

None of these changes will provide the thrust growth historically required to counter the improving enemy threat or to expand mission capability.

Under the EMDP as currently planned, a decision to proceed, or not, into FSED to achieve more thrust is not called for until 1985.

If a decision is made to proceed, the configuration would not be qualified for production until mid- to late-1988.

The Air Force now plans to conduct a competition for procurement of a dual role fighter based on either the F-15 or F-16, with selection to be complete by mid-1983. Engine delivery, starting in mid-1987, would be required to meet planned aircraft procurement.

If it becomes apparent that the winning aircraft, in order to perform its dual role mission, requires increased engine thrust, no version of the F100 can be available -- following the current plan -- until a year to a year and a half after the scheduled start of deliveries of the dual role fighters.

In order to have the F100 EMDP configuration available in time to meet the planned dual role fighter deliveries schedule, FSED must be started no later than mid-1983. This can be accomplished by accelerating the decision point from early 1985 and further expanding the scope of the effort planned for the EMDP.

The advanced models of F-15 and F-16 aircraft that will fulfill the dual role mission (air-to-air/air-to-ground) represent substantial changes in aircraft capability when compared to the original F-15As and F-16As powered by the current F100 engine.

For example, the F-16E provides vastly improved capability in both air-to-ground missions with substantially increased bomb load, and in air-to-air missions with increased weapons carrying capability.

These new capabilities, along with range improvements, will be provided by changing the aircraft configuration with both a larger wing and a longer fuselage.

These configuration changes would result in improvements in aircraft performance relative to the F-16A in some portions of the flight envelope and degradation of performance in other portions, if the F-16E is powered by an engine with thrust equal to today's F100.

The larger wing will provide better turning capability than the F-16A over most, but not all, of the flight envelope, because of the lower wing loading. Conversely, because the new airplane is heavier than the F-16A, it will have less excess power available for maneuvering. This will result in reduced climb rate and a substantial increase in the time needed to accelerate to supersonic speed to engage another fighter in combat.

An engine with more thrust than the existing F100, such as would be provided by the F100 EMDP engine, restores the performance of the F-16E, relative to the F-16A, and maintains the substantially greater mission capability of the F-16E.

In the air-to-ground role, more thrust would increase the F-16E's payload while meeting short field take off requirements. It also would provide higher penetration speed and greater missile evasion maneuverability.

In addition to the benefits of more thrust for expanding mission capability in advanced models of the F-15 or F-16, an examination of the latest foreign aircraft entering service in the mid-1980's clearly shows that more engine thrust will be needed in current combat mission scenarios to insure a decisive U.S. advantage.

The need for more thrust thus becomes both obvious and imperative if U.S. Air Force pilots are to maintain their combat superiority.

Lack of Symmetry in Engine Competitions

The next matter discussed is the developing atmosphere of what we would would term "the lack of symmetry in engine competition."

If the Defense Department's objective--as indicated in Air Force presentations--is to maintain a competitive inventory of two suppliers for large fighter engines, then its relationship with the competitors must be essentially symmetrical.

We have no quarrel with the idea of competition. Federal procurement regulations require it, and there are many benefits to the taxpayers which flow from it. But competition, by its very nature, implies a contest between parties on comparable terms.

Consider, for example, the original competition for the F100 engine for the F-15 aircraft. We and General Electric were awarded about $50 million each for an Initial Engineering Development Program from mid-1968 to early 1970 to design and demonstrate our candidate engines. The equitable funding and timing made this a fair and forthright competition.

If, however, one contestant is prejudicially constrained, for whatever reason, it raises questions not only of fairness, but also more basically, of whether or not there is competition at all.

There are three aspects of the present engine procurement environment which are asymmetrical:

1. The inconsistent application of whether to compete or re-compete a particular award;
2. The conscious or unconscious predetermination of the winner; and
3. The disparity of research and development funding which handicaps one competitor relative to the other.

The Air Force apparently has decided to re-compete the engine for F-15 and F-16 aircraft, an application that our F100 engine won in the competition decided in 1970. We understand and acknowledge the Government's right to re-compete an award at any time. The same logic, however, has not been applied to other programs.

The engine for the B-1B program, which involves substantially greater aircraft modifications than anything in prospect for future F-15's and F-16's, was not re-competed.

New orders for KC-10 engines are not being re-competed. There was no competition at all for the engine for the Advanced Technology Bomber, a brand-new procurement. Orders for the Navy's F-18 engine, for which there was no competition in the first place, are not being competed now. Engines for the Navy's SH-60B helicopter, and the Army's UH-60A and AH-64 helicopters, originally competed for in the early 1970s, are not being re-competed. The list could go on.

The point is: Why is it that the Government perceives "re-competing benefit" only in the case of large fighter engines?

It has been alleged that the large quantity of engines yet to be delivered--some 5,000 according to Air Force planning figures--singles out the F100 program for re-competing. This notion, however, would not explain the failure to re-compete the F404 engine for F-18 and F-5G--of which about 5,500 are yet to be delivered--or the T700 engine for UH-60A, SH-60B, AH-64 and HH-60 helicopters which have about 5,300 yet to be delivered.

Pratt & Whitney has competitive engine candidates for many of these uncompeted awards. And given funds similar to those provided General Electric to make the F101 Derivative Fighter Engine a competitor to our F100, we could have competitive offerings for all of the above applications.

The second competitive anomaly we resist is the so-called "dissimilar competition" between the F100 and the F101 DFE.

It is unique in jet engine procurement history for a contracting agency to provide sole source funding to one contestant, and dictate for the other a configuration which is inferior in thrust by some 4,000 pounds, and to call that "competition."

We are not unwilling to compete for follow-on contracts to the production business we now enjoy. We believe, however, that we should be allowed to compete on an equal footing. Funding should be provided for qualification of our increased-thrust configuration in a time frame consistent with that of our Air Force-supported competitor.

The third aspect--research and development support--is shown in Figure 3, which tabulates government funds provided to Pratt & Whitney and General Electric over the past five years in component improvement and similar contracts, and full scale engineering development programs.

Figure 4 tabulates planned support over the next five years. It is evident that our competitor will receive, over the 10-year period, nearly $1 billion more in engineering support than we will.

Several of the development programs, such as F404, F101 DFE, and F101-GE-200 are worth hundreds of millions each, and were awarded to General Electric without solicitation for competition.

These kinds of funds are the life blood of a high-technology engine company. They provide the means for bringing products to production readiness and solving problems revealed in operational service experience. They have a profound effect on our future business base, and being on the short end by nearly a billion dollars -- for whatever reason -- puts us at a very substantial disadvantage.

More particular to the question of large fighter engine competition, Figure 5 tabulates the funds from both company (Independent Research & Development - IR&D) and government sources, which have been provided to date for F100 Engine Model Derivative (EMD) and F101 DFE demonstrator programs.

Also shown are government funding of the baseline engine programs from which these demonstrators derive. In addition to what is shown, the Air Force is planning to invest a total of about $32 million over the next three years in Pratt & Whitney's demonstrator, and about $125 million in General Electric's.

You can see that despite a very sizeable investment of our own company funds, we are unable to match the pace of Air Force support of our competitor. Pratt & Whitney cannot compete with this handicap.

Pratt & Whitney has been a valued engine supplier to the Government and a leader in our field for more than 50 years. There have been some problems with its products over the years, and some ups and downs in dealings with its Government customers, some of which are related here.

On balance, though, Pratt & Whitney's contributions to national security and our business successes have been extraordinary. We have enjoyed an enviable record of prevailing in past competitions, and it is our earnest goal to compete successfully for future business.

We ask an opportunity to pursue that goal in an equitable, competitive atmosphere.

Summary & Recommendations

The following summarizes the Pratt & Whitney position:

- The F100 engine has a well-documented history of performance excellence in the F-15 and F-16.
- Pratt & Whitney has its money on the line with industry-leading warranties to insure the F100's durability.
- The F100 EMDP offers the normal performance (thrust) growth for the F100 that historically applies to successful weapon systems.
- Today's lack of symmetry in engine competitions is unique in the history of the jet engine, and is incomprehensible. We believe an engine competition that is inequitable in performance and schedule is not a competition, but a justification for a preordained decision.

Pratt & Whitney's recommendations are:

1. Because competition makes sense, Congress and DoD should look at all engines, not only at the F100. Pratt & Whitney already has a competitive engine, or can have, if given the funds similar to those provided to the F101 DFE, to the F404, F101, and T700.

2. Assuming the Air Force proceeds with its planned "dissimilar" competition for follow-on F-15 and F-16 engines, Pratt & Whitney should be supported in competiting in a fair and clearly defined manner.

3. Congressional action should be taken to fund full scale development of the F100 EMDP in a time frame consistent with that fair competition.

COMPRESSOR ANOMOLIES REDUCED DRAMATICALLY

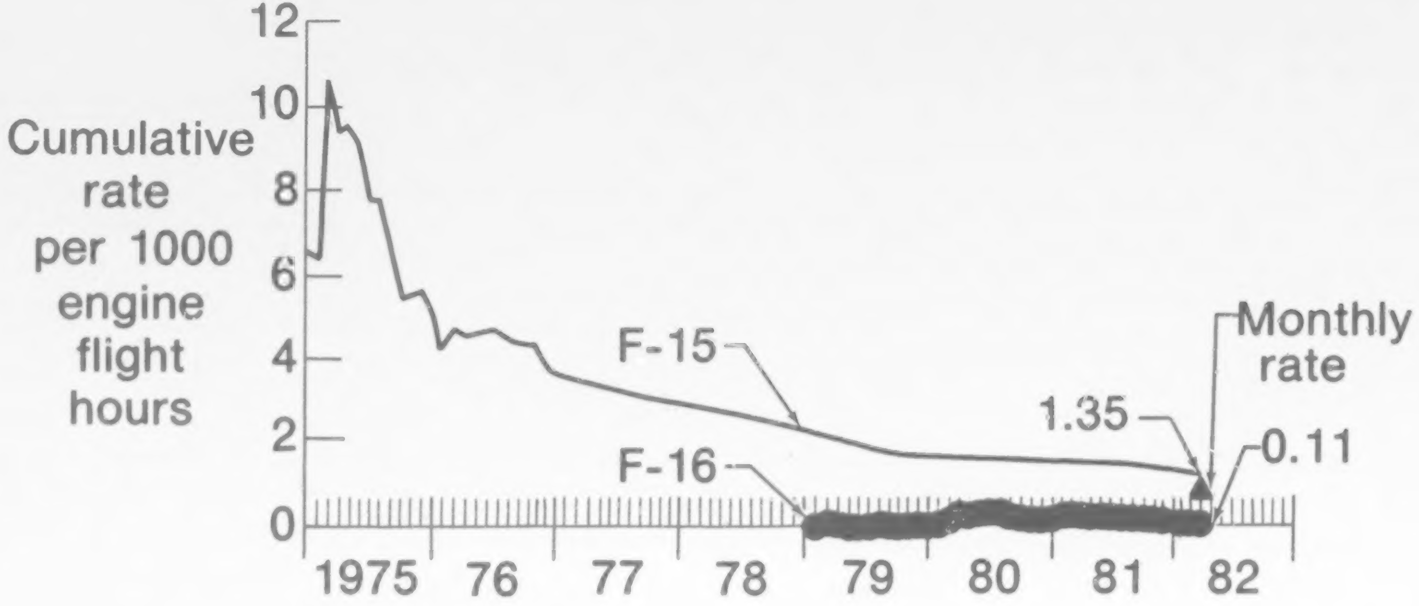

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Figure 1

CURRENT USAF F100 ENGINE PLAN

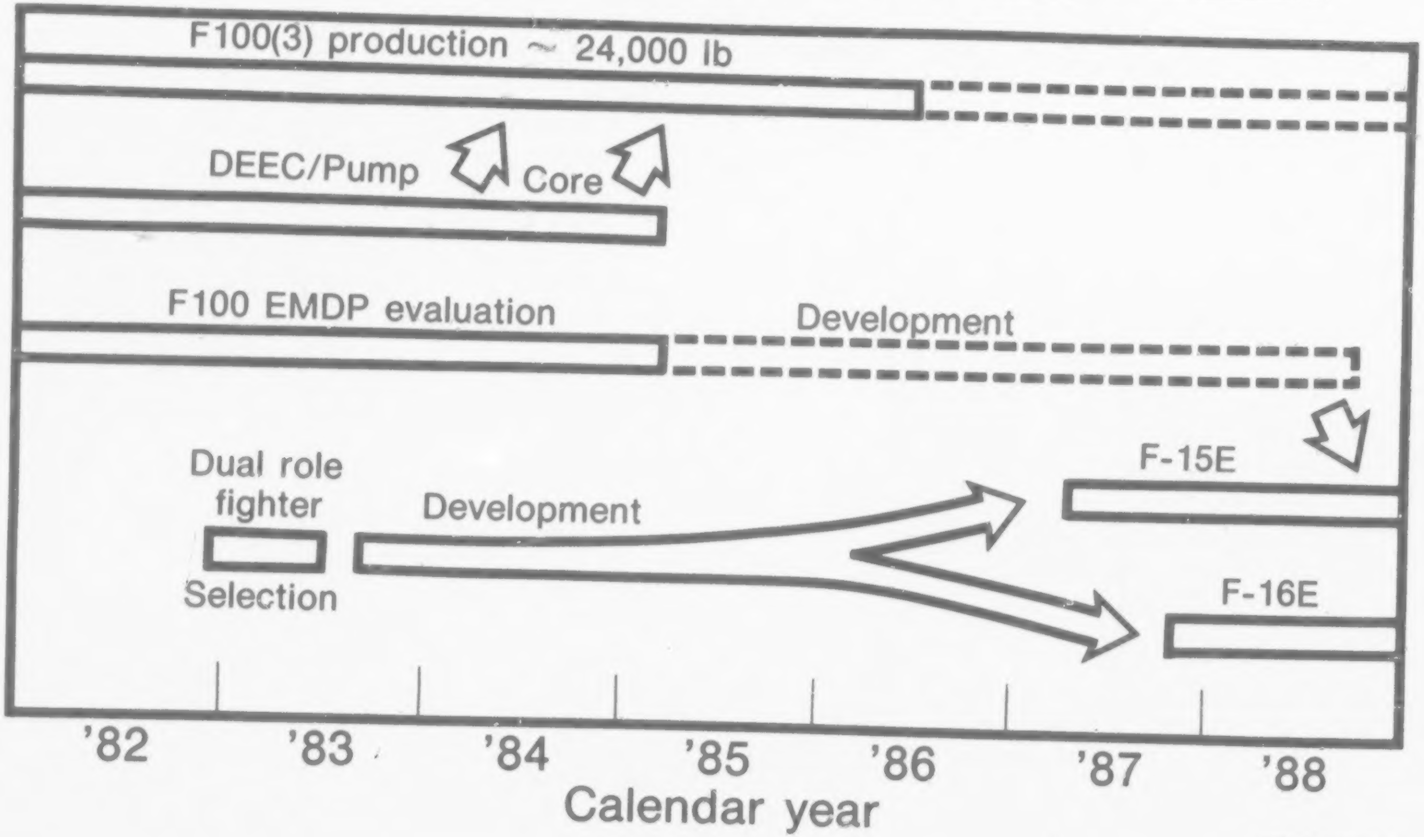

Figure 2

GOVERNMENT FUNDED ENGINEERING SUPPORT

(THEN YEAR $ IN MILLIONS)

	1977		78		79		80		81	
	P&W	GE	P&W	GE	P&W	GE	P&W	GE	P&W	GE
Component Improvement	77	105	98	113	122	90	119	91	130	108
Development	11	110	11	84	4	112	1	80	3	64
Total	88	215	109	197	126	202	120	171	133	172

Average GE	191
Average P&W	115

Figure 3

AV238727A 820308 LF 204

PROJECTED GOVERNMENT FUNDED ENGINEERING SUPPORT

(THEN YEAR $ IN MILLIONS)

	1982		83		84		85		86	
	P&W	GE	P&W	GE	P&W	GE	P&W	GE	P&W	GE
Component Improvement	112	108	122	111	120	151	126	195	128	223
Development	11	119	18	169	13	90	9	24	10	8
Total	123	227	140	280	133	241	135	219	138	231

Average GE	240
Average P&W	134

Figure 4

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COMPARATIVE R&D FUNDING

(THEN YEAR $ IN MILLIONS)

	Derivative Demonstrator Programs				Baseline Engine Programs	
	F100 EMD		F101 DFE		F100	F101
Calendar Year	Company IR&D	DOD Contract	Company IR&D	DOD Contract	CIP (DOD)	FSD/CED (DOD)
1976	9	0	6	0	61	83
77	15	0	3	0	40	75
78	15	0	5	0	53	45
79	23	2	0	37	47	14
80	24	3	0	43	52	3
81	18	15	0	33	63	27
82	13	9	0	40	62	69
Total	117	29	14	153	378	316
	146		167			

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Figure 5

Development Funds Required For Increased Thrust F100 Engine (PW1130) In Then Year Dollars

1983 (FY)	$44 Million
1984	58 "
1985	44 "
1986	15 "
TOTAL	$161 Million

Development Funds Planned For Continued Development Of The F101 DFE In Then Year Dollars

1983 (FY)	$54 Million
1984	68 "
TOTAL	$122 Million

QUESTIONING OF GENERAL ELECTRIC

Senator **Stevens**. Thank you very much.

Under our arrangements now we will have a period of questions for GE. They presented their statement first. We do appreciate your patience.

Gentlemen, I have to go to that meeting. Senator Weicker, will you chair? When you leave, Senator Andrews will Chair for the balance of the time.

I do thank you both for presenting your statements. It is a very significant problem for us to deal with. I will ask the Air Force to give us a statement concerning the implication in the Pratt & Whitney statements concerning expansion of the air inlet to 270 pounds and see if that is involved in their consideration, but that is just a statement for the record.

Thank you very much.

[The information follows:]

Pratt & Whitney Statements

A larger inlet would allow for better F-101 DFE performance in the high altitude/slow speed regime of the F-16 flight envelope. Because of increased drag, a larger inlet would also reduce the maximum attainable speeds and reduce range. We see nothing which says a bigger inlet is needed; and currently have no plans to pursue a larger inlet.

Senator **Stevens**. Senator Chiles, you have an opening statement? Do you wish to make it at this time?

Senator **Chiles**. Mr. Chairman, I will submit it for the record.

Senator **Stevens**. We will print the statement in the record at the beginning of the hearing.

Senator **Weicker** [presiding]. Senator Chiles, any questions?

Senator **Chiles**. Yes, I do.

FAA QUESTIONING OF LOW-CYCLE FATIGUE LIFE PREDICTION SYSTEM

I understand that the Federal Aviation Administration has questioned the validity of your low-cycle fatigue life prediction system and has recently reduced the required inspection interval in the CFM-56 engine.

Isn't this the same core that is in the F-101 derivative fighter engine? Would you explain that for me?

Mr. **Krebs**. The core is very similar. It is probably 70-percent similar on a cost basis. But it has a number of differences in usage and design detail and some difference in weight. The cycling life of the F-101 derivative fighter engine is as we have stated, 4,000 cycles for the hot section and longer for the rotating parts of the engine.

You can't draw a direct parallel between the transport version and the fighter version. The FAA usually specifies inspection interval based on amount of experience at that point in transport type operation and that interval is extended as the machine gets further passenger service. It is a normal procedure and it is very good. I don't think you can connect that early designation of inspection time by the FAA and the fighter life that we are talking about here.

Senator **Chiles**. Explain to me why they would not be similar.

Mr. Krebs. They are different types of service and usage for one thing and the designs are different in detail and weight and so forth. The procedures of the military and the procedures of the FAA are somewhat different.

Senator Chiles. There would be even more problems, would there not, with fatigue and high pressure in the fighter engine than there would be in the CFM-56 engine?

Mr. Krebs. Yes; the service in the fighter is definitely more severe. Transport lives are longer because their service does not involve nearly as many throttle cycles and so forth.

The FAA's procedure is usually to take the demonstrated lives in a transport engine at the time they start service, divide by some number and specify that as the initial inspection interval of that hardware. That is the procedure that I believe is being followed on the CFM-56's and other engines.

STRESS SITUATIONS OF TRANSPORT ENGINES

Senator Chiles. Then you are saying that I am right that the transport engine would not be put under the stress that the fighter engine would?

Mr. Krebs. Not nearly as severe operation so it has longer life in hours than a fighter would have.

Senator Chiles. If there was a potential problem of fatigue in a transport engine that would be even a more severe problem in the fighter engine because of the additional stress?

Mr. Krebs. Well, the life in the transport rotating parts has gone upward to 20,000 hours—20,000 flight cycles or so. The life we are talking about here is more like 4,000 to 5,000 hours or 8,000 TAC cycles for the rotating parts.

TAC CYCLES

Senator Chiles. Is there a difference between cycles and TAC cycles?

Mr. Krebs. The vocabulary is a little different, but it applies to the same thing. I am trying to give you the answer in consistent terms.

Senator Chiles. But you would not be using the throttle in the transport engine to the same extent that you would be using it in the fighter engine?

Mr. Krebs. That is correct, Senator.

Senator Chiles. As you were using the throttle much more, then you would have to worry about the stress you would be putting on the engine and therefore more fatigue?

Mr. Krebs. That is why fighter engines do have less life than transport engines—because of that extra severity. The transport lives are much longer then the lives we are talking about today for fighter engines. Four thousand TAC cycles represents the hot section goal here of the Air Force.

What we demonstrated in the F-101 DFE is as I mentioned, 2,000 to 2,500 hours of fighter hot section operation. Usually in the transport engine hot section you seek 8,000 to 12,000 hours of transport operation. You can do that because the number of throttle cycles is only a fraction of what it is in the fighter.

I think the real point is that the cyclic life that we have achieved in this hot section, for the combustor, the vanes, the blades, and all the material that is bathed in this 2,500° temperature, is two or more times the standard of whatever has been done before. We have done that both on our F-101 DFE and on the latest testing of F-404 engines. That is a new standard.

I think the industry can do it, our state of the art can do it and it will be of enormous benefit.

ACCELERATED MISSION TEST

Senator CHILES. Would you consider the accelerated mission test to be a significant statistical basis for confidently projecting operation and durability of the F-101, particularly when you are having to change certain components of the F-101 DFE due to unexpected problems encountered in operational use?

Mr. KREBS. Sir, I consider the accelerated mission test a wonderful way to establish the life of an engine because it puts so much time and cycles on the engine in such a short time.

One accelerated mission test which duplicates 2,500 hours on one set of parts can be run off in a few months time. That engine will have more service on that one set of parts than the high-time engine in a fleet of a couple thousand engines with a million flight hours total experience.

In the old days you had to wait for a million hours or more of service to know where you stood. You had to wait that long for a handful of engines to get up to 2,000 or 2,500 hours life.

Senator CHILES. You don't think you have to wait that long——

Mr. KREBS. Not at all.

Senator CHILES [continuing]. To identify early operational problems?

Mr. KREBS. You don't have to wait. You do that by accelerated extra severity factory testing. Statistically that is very sound particularly for the hot section where you are testing 60 turbine buckets in every wheel and 60 vanes. You have a good statistical number. By the time you run several of these things you know a lot more than you would with a million hours of flying a large fleet.

Certainly service is worth something. You also find some surprises. That is why we have been flying in the F-14's and the F-16's.

THRUST ISSUE

Senator WEICKER. How does GE respond to Pratt & Whitney's position that the thrust is the issue?

Mr. KREBS. We think that it is not the issue. Thrust is just one aspect of aircraft performance. Mr. Carlson talked solely of thrust.

It was interesting that he and I brought the same chart. His was in terms of thrust showing the difference between his engine and ours with inlet sizes from 254 to 270.

AIRCRAFT PERFORMANCE

My chart was in terms of aircraft performance. Aircraft performance is the bottom line here. Mr. Carlson did not once mention, as I recall his testimony, the word "weight." My point was that our extra weight of 700 pounds, plus ballast is 900 pounds, or 2,000 pounds in the F-15, times the number of G's—7 to 9 G's—which multiplies weight in maneuver offsets that thrust in aircarft performance. I wish it were not so.

I would like to have a performance advantage, but our weight does offset our thrust. Therefore the Air Force says, General Dynamics says, McDonnell Douglas says—I have wrestled with their engineers for 5 years—and they say performance is the standoff. Yes, we have more thrust. Thrust is not the issue. Aircraft performance is a standoff.

FLIGHT DESIGN/FLIGHT WEIGHT

Senator WEICKER. How do you respond to a letter dated February 8, 1980, on the letterhead of the General Electric Co., to General Alton Slay, signed by James Krebs, and I will read the pertinent paragraph:

> The flight design/flight weight of F-101 DFE was put on test in December and has already attained full production performance. It was run at 27,000 pounds thrust at F-16 air flow and 28,200 pounds thrust at F-14 air flow with comparably good SFC's.
>
> This thrust will be vital necessity in attaining the kind of F-14 performance with which to counter the Navy's fleet defense threat after 1985 and is likely to be a very important requirement if future F-5's and F-16's are procured for expanded air to ground or multi-mission roles. Air to ground missions will result in substantial increased drag due to added external weapons stores which will require high dry thrust for speed, some maneuver, and rate of climbing. The increased thrust provided by the F-101 DFE is important.

That flies in the face of the statement here.

Mr. KREBS. I stated I hoped to have a performance edge. That letter is 2 years old. When I wrote it I expected to see a performance advantage. Since that time we have installed it in both airplanes and we have flown it. We know the performance is a standoff. So we have learned that performance is a standoff. We need our thrust to overcome our weight.

THRUST-TO-WEIGHT RATIO

Senator CHILES. What if you increase the weight of the plane 10,000 pounds?

Mr. KREBS. I am told by General Dynamics and I have to go with them, what they tell me on performance, that our weight is still offsetting our thrust. It is the thrust-to-weight ratio once again.

Senator CHILES. I understand. You make a good argument at one particular weight that you have given up something because of the weight. It seems to me when you add weight to the F-16 in the air-to-ground mode that we are talking about doing, it is pretty clear that if you enlarge that air intake your thrust is going to be greater.

Mr. KREBS. Our thrust is greater.

Senator CHILES. Therefore your performance—let us get back to the performance—your performance is going to be better?

Mr. KREBS. Our thrust is greater. If we increase the inlet size to 270 we will be able to operate at full thrust, but our weight is also greater and that offsets it in the larger airplane.

Now the F-16 being a 48,000-pound airplane, full weight compared with the F-16C's and F-16D's at 10,000 pounds less may have somewhat lower turn rate, somewhat longer takeoffs and so forth.

Again the performance supplied by the F-100 improved engine and F-101 DFE as we have it, whether the inlet is 254 or 270, is said to be a standoff, we will know that later this year because we are going to fly the E model with both engines in 1982.

DEMONSTRATION TESTING OF BOTH ENGINES

Senator CHILES. If we are really talking about competition and that is what both sides say they want and that is what the Air Force says they want, everybody wants competition, then should we not allow both engines to be able to demonstrate themselves on the basis of greater thrust?

We are talking about the future for 15 years at least that we are going to use these engines. If we are talking about that future for 15 years and you are saying you want competition and the whole basis should be performance and that is what Pratt & Whitney is saying and that is what General Burke is saying, then it would seem to me that the sound thing for us to do is to allow you all to compete and that is to allow everybody to get in the ball game and get their best engine.

Wouldn't the taxpayer be better off to do that?

Mr. KREBS. The Air Force position I think is that the F-16E or the other models of the F-15's and F-16's have satisfactory, entirely adequate performance with the improved F-100 and the F-101 DFE as they have stated.

Senator CHILES. Today?

Mr. KREBS. Yes. I heard General Burke say as far as he can see in the future that thrust is adequate. Now that does not mean that there never will be additional capabilities, and additional requirements perhaps to meet future threats, that will change things. Who knows, the day may come when some additional performance is necessary.

As far as I can see the Air Force said they are satisfied and they want to run the competition now instead of delaying it for a number of years. They want to run it using the money they have allocated for the completion of the development instead of a lot more money than that and later.

Senator CHILES. From our standpoint we are the ones who are going to pay the money out, the taxpayers are, over a number of years. I think we have to determine what is the sound way to do that.

You know we could have cut the competition off before you got your engine up to snuff. There would not have been any doubt how it would come out then. Now if we cut the competition off and you don't allow Pratt & Whitney to get the engine up to snuff it seems to me as soon as a pilot says, when he gets into the heavier airplane, "Look, one of these engines can give me more thrust, one of them will give me more power," I know what the pilot will want. He will want that thrust and power.

WEIGHT PARAMETER IN FIGHER AIRCRAFT

Mr. **Krebs.** Don't forget weight. It is a terribly important parameter in fighter airplanes.

Senator **Chiles.** I think it is until you add 10,000 pounds.

Mr. **Krebs.** It is even more important. We have more of a weight problem in the E than we have in the C, yes, sir.

Let us get on with the competition now. If they were to be funded for more thrust we should be funded for less weight. I don't think that makes sense right now, for initial competition.

Senator **Weicker.** Senator Andrews.

IMPROVED WARRANTY TO AIR FORCE

Senator **Andrews.** A lot has been said about dependability by you and by Pratt & Whitney. As fond and confident as you are about the F-101 DFE, what kind of improved warranty might you offer the Air Force?

Mr. **Krebs.** I frankly would rather not get into the details of that because when there is going to be a competition the nature of those warranties will be a proprietary matter.

Senator **Andrews.** We are making the decision on which engine. We want to look awful close to what warranty comes with that engine.

Mr. **Krebs.** Last fall the Air Force put out a request for information to get calibrated on the general levels of performance and weight and engine price and life cycle cost and warranties. We supplied a thick volume and Mr. Ward put together that detail, including a chapter on warranty.

I assume Pratt & Whitney did likewise. The Air Force had that information. I really prefer, sir, you get that data from them.

Senator **Andrews.** How does your warranty on the F-101 engine compare with the warranty you are going to give the Air Force on the engine that will be installed on the B-1, the same warranty?

Mr. **Krebs.** No, the only warranty we have so far——

Senator **Andrews.** You are not as proud of that?

Mr. **Krebs.** We have been asked for a warranty for the first block of production of the F-101's. I think that covers something like 40 engines, a very small sample of engines. We supplied a warranty that satisfied the Air Force.

Senator **Andrews.** Sometimes it satisfies the Air Force, it does not satisfy this committee. We got into a question of the C-5, that wobbly wing turkey, quite a while ago. Some members of the subcommittee voted against that. Part of the reason is because we weren't happy with the cost control warranties and a whole host of other things.

I think the American people are concerned about what kind of warranty comes out and the kind of standing behind these products that go into the military efforts of our Nation.

I would suggest that you get us some information on this warranty business or have the Air Force get us some information on the warranty business. I think speaking for myself, but I would also think speaking of my colleagues on the subcommittee, we are going to look at that as a darned important factor in whatever type of engine competition we are getting into if we are going to buy that many units down the line.

Mr. **Krebs**. I agree 100 percent, you should be concerned. I think you will be happy when you see the kind of warranty we are talking about. It is very impressive.

LIMITED WARRANTY ON BOMBER ENGINE

Senator **Andrews**. I take it from your remark that you are not giving the same type of warranty on your bomber engine that you are on the F-101 DFE?

How did they let you slip by on that? Maybe we ought to recompute that and get a better warranty.

Mr. **Ward**. Sir, we have responded with several different types of warranty to the Air Force for the B-1 bomber engine. They have selected from these various offerings the warranty that they desire and that is what we now have. They wanted a limited warranty on the first block of engines.

Senator **Andrews**. They wanted a limited warranty?

Mr. **Ward**. On the first block of engines and that is what we have given them.

Senator **Andrews**. I am glad they are satisfied with that.

Mr. **Krebs**. The point that we are making is that a strong warranty requires a large enough fleet. It is hard statistically to deal with a warranty that covers only a block of 40 engines.

Senator **Andrews**. I think before we go into this down the line, purchase more and more engines of the bomber type, whatever other type, the helicopter types and the others, that we ought to start taking a look at these warranties and find out if that should not be thrown into bidding equation because we are talking about purchasing thousands of units.

Cost overruns, the parts, the breakdown and maintenance problems can double the price of those engines out in the field if there is no warranty.

Senator **Andrews** [presiding]. Senator Rudman.

Senator **Rudman**. Thank you very much, Mr. Chairman.

I really have a fairly serious question for the people at Pratt & Whitney.

I will say to Mr. Krebs I really think you have done a first-rate job. I sit here at the hearing and I wonder what we are doing sometimes because you are being penalized for coming out with a first-rate engine. That is the feeling I get about what has happened. I don't like it.

My State does not have a damn thing to do with either one of these companies. We will be lucky in New Hampshire if we make the handles for the paint brushes to paint the wheels with, worth three bucks for each airplane.

Senator **Andrews**. We feed the pilots.

Senator **Rudman**. I want to say to you as far as I am concerned if this gets into where I think it will, maybe we should give you some money to get the weight down. That point has been lost.

If I understand the history, and I have no interest in either one of these companies, you people picked up on this because you saw some real problems with the F-100 engine.

Is that an accurate statement?

Mr. **Krebs**. We wanted a shot at the large engine fighter business and we made a decision in 1975 to proceed with a couple of company-funded demonstrator engines. At that time period there were some problems.

Senator **Rudman**. They were referred to here in several bits of testimony. Pratt & Whitney is a first-rate company, but they had some problems at that time. You put $16 million of your own money on this and came up with a demonstration?

Mr. **Kerbs**. We put in money. The total company money in it is something like $25 million now.

PERFORMANCE RATIOS

Senator **Rudman**. What we are worrying about now is a real worry from Pratt & Whitney's point of view. If that inlet is opened, I can see they will have some problems. I am a pilot, I have done a lot of flying in light jets, I understand what you are talking about. At the 10,000-pound weight of the F-16E with the additional 900 pounds of weight you have in your engine, I want to know just what the performance ratios are going to be.

Will you please supply that for the record? I am sure you must have that.

Mr. **Krebs**. I can give it to you for my engine. I think really, if I can make the suggestion, it should be General Dynamics or the Air Force that supplies this comparison. You can pick out a number of points where our engine has an advantage, a slight advantage. You can pick out a number of points where the Pratt engine because of its lighter weight has an advantage. You can do that for all airplanes.

The point is that it is the balance of all these factors for both airplanes that is said to be comparable, proven comparable on the F-16, because it has flown. It will be proven later this year with the new wing when the F-16E, the second airplane over there, flies.

[**Clerk's note**.—Engines were not tested at the time the request was made for the information. Should the information be received by the committee after these hearings are printed, the information will be retained in the subcommittee files.]

E SERIES FLYOFF

Senator **Rudman**. Later this year when we have the fly-off on the E we will know whether or not there is any difference. Of course that will be with the 254- and 270-pound inlets.

You will still be lugging around that 900 pounds no matter what size the inlet?

Mr. **Krebs**. That is right.

Senator **Rudman**. Mr. Krebs, I think we should continue this competition. If we are going to fund, and maybe we should fund, Pratt & Whitney for increased thrust, maybe we should fund you for less weight. Let us keep it fair if that is what we are going to do.

Mr. **Krebs**. I think we should have the competition now and for the longer range future both they and we could be funded for additional technological improvements.

Senator **Rudman**. I probably agree with that also.

Senator **Andrews**. Senator Schmitt.

WEIGHT FACTOR

Senator **Schmitt**. Is weight an important factor in GE's ability at this time already at the 4,000 cycle to have apparently higher reliability and durability and other things? Does weight make the difference?

Mr. **Krebs**. It is certainly part of the story. I mentioned that our thrust-to-weight ratio was 5 percent poorer. More cooling air does not add weight, but it does decrease thrust-to-weight ratio.

The story of our increases in life to 4,000 cycles, is interesting. We didn't have that in 1975, but we set the standard, we said let's do that, let us have 4,000, and it took us 4 or 5 years to get it.

Part of that story is metallurgy, part of it is cooling air, part of it is design technology, part of it is weight. It is all those things. It started from setting the standard to do the job. Can Pratt double their life? Maybe they can. They are trying.

Senator **Schmitt**. Have you looked at your engine to see if you can maintain 4,000 cycles with decrease in weight?

Mr. **Krebs**. I think the technology of the future will certainly bring that about.

Senator **Schmitt**. You would have to push that technology base right now?

Mr. **Krebs**. Yes; that is right. In anticipation of the needs of the 1990's there should always be a certain amount of work going on for engine improvement.

Senator **Schmitt**. It is the combination of the use of new materials as well as new techniques such as the cooling technique?

Mr. **Krebs**. Absolutely and all of the high-powered thermal stress and process technology that we have these days, mechanical technology.

Senator **Schmitt**. And automatic control activity?

Mr. **Krebs**. Automatic controls reduce the temperature overshoots in transients. You cut down the temperature blasting onto the hot parts. Yes, sir.

Senator **Andrews**. Senator Chiles.

Senator **Chiles**. No further quesitons, Mr. Chairman.

Senator **Andrews**. Thank you very much.

We will proceed with the Pratt & Whitney people.

WARRANTY ON F–100 ENGINE

Mr. Carlson, what kind of warranty are you prepared to give on this or is it a deep dark secret?

Mr. **Carlson**. Senator Andrews, we initiated the no-cost warranty on the F–100 engine and, as I stated in my testimony, we gave that to the Air Force about 2 years ago.

We currently warrant the 1,800-cycle turbines for 1,350 cycles or 5 years. We make no charge for that warranty and we are audited very carefully to make certain that we are not putting into our overhead account charges for that no-cost warranty.

As I say in my testimony, we will probably offer the same no-cost warranty to the Air Force when we bring out our 4,000 tactical cycle turbine that is currently in effect for the engines being produced now and for the engines that were produced earlier that gave 1,350 tactical cycles.

I am very happy to go on record and tell this committee that we told the Air Force when we gave them the first warranty that it was our intention to continue to increase the warranty coverage, again at no charge, as we increased the turbine life.

Senator ANDREWS. We just discovered that the General Electric people have spent $25 million, if I recall correctly, of their own money in the development of their engine. Your engine has been around for quite a while. You state that the program is important to you.

How much of your own discretionary money have you used to improve the F-100 engine?

Mr. CARLSON. Up to now we have spent on the F-100 engine $117 million of our own money. We have been specifically prevented by the Air Force from spending any CIP funds for incresing the thrust of the engine.

Senator ANDREWS. You mean the Air Force doesn't want increased thrust?

Mr. CARLSON. Not using CIP funds. CIP funds are a good investment, as I am sure this committee has heard before. Our records will show that for every dollar of CIP funds that you permit us to have we return to the Air Force $6 in savings. I think that is quite important.

COMPETIVENESS OF PRATT & WHITNEY

Senator ANDREWS. Within the $17½ million that we have provided this year, fiscal 1982, and $5 million in 1983 for increased thrust, can Pratt & Whitney become more competitive in the F-16E engine contest?

Mr. CARLSON. Those funds both in dollars and timing are going to be insufficient for us to have an engine of equitable thrust by the time the proposed fly-off may satisfy the Air Force's curiosity about whether thrust is going to be required. We firmly believe increased thrust is going to be required and believe that the figures we have shown you today indicate that requirement is real.

Those performance numbers, by the way, that we gave you on the 16E in a combat regime, air to ground, are General Dynamics' performance numbers.

Senator ANDREWS. If that amount of dollars is not enough, how much would be enough?

Mr. CARLSON. We need $164 million to bring the engine forward to the point where we could have completed full development.

Senator ANDREWS. You are talking about the $164 million additional?

Mr. **Carlson**. To give us equivalent thrust, full-scale development.

Senator **Andrews**. Additional in 1983?

Mr. **Carlson**. No; not in 1983. That is over a 5-year period. We will be happy to provide for the committee a record delineating the dollars required by year to bring us forward to the point in time when the F-16 actually goes into production, the Air Force would have a truly equitable competion and two engines of comparable performance and thrust and durability to choose from.

Senator **Andrews**. Could the work be completed by 1985?

Mr. **Carlson**. Yes; it could be.

Senator **Andress**. It would be?

Mr. **Carlson**. It could be by accelerating funding and the development schedule.

DOLLAR ESTIMATES ON ADDITIONAL FUNDING

Senator **Andrews**. Could you provide for the record the dollar estimates that you have for that type of development that would give us that kind of result by 1985?

Mr. **Carlson**. The schedule we will submit for the record will show program completion by 1986. Based on funding being provided by mid-fiscal year 1983.

Additional funds needed to develop a higher thrust competitive engine (PW1130)

Year	Outlay
1982	$3,000,000
1983	44,000,000
1984	58,000,000
1985	44,000,000
1986	15,000,000
Total	164,000,000

Note.—These funds are in addition to ongoing F-100 improvement efforts for which funding has already been identified.

FUNDING FOR THRUST IMPROVEMENTS

Senator **Andrews**. Senator Chiles.

Senator **Chiles**. Can you tell us for each fiscal year how much money has been appropriated for improving thrust on the F-100 and how much for the F-101 derivative engine?

Mr. **Carlson**. Yes; I will ask my people if they can pull it out here. If we don't have it we will provide it for the record.

Mr. **DeSantis**. The Air Force has not specifically devoted any of its funds for increased thrust of the F-100 engine.

Senator **Andrews**. The Congress has attempted to do that. Is that right?

Mr. **DeSantis**. Yes.

Senator **Andrews**. Give me those figures for the record.

Mr. **DeSantis**. Yes, sir.

[The information follows:]

Funding for F-100 Engine Thrust

Prior to 1982 no Air Force funds were appropriated for improving thrust on the F-100 engine. Congress appropriated $17.5M in 1982 for improving F-100 thrust, however, this funding has been put in a "hold" status pending resolution of a procedural question between the Air Force and Congress.

Funds apropriated for continued development of the General Electric F-101 Derivative engine are as follows: Fiscal year 1979: $33M; fiscal year 1980: $30M; fiscal year 1981: $52M, totaling $115M. Another $35M was appropriated in 1982 for the F-101 derivative. The Air Force has indicated that another $54M will be required in fiscal year 1983 and $68M will be required in fiscal year 1984. The total through fiscal year 1984 for the F-101 derivative would then be $272M.

ADMINISTRATION REQUEST FOR F-100 DEVELOPMENT

Senator **ANDREWS**. You have given the answer to how much money and how long it would take to bring the F-100 engine into a position where there could be full competition.

How much did the administration request for F-100 development this year?

Mr. **DESANTIS**. The administration through their CIP program has recommended about $60 million for the component improvement program.

Senator **ANDREWS**. How much in actual budgeted funds?

Mr. **DESANTIS**. The request was for $60.6 million.

Senator **ANDREWS**. How much for the thrust?

Mr. **DESANTIS**. They have not released any funding to my knowledge for increased thrust for the F-100 engine.

Senator **ANDREWS**. And they didn't request any budget funds for the F-100 increased thrust?

Mr. **DESANTIS**. No. They have requested some $40 million for the digital electronic control that General Burke spoke about and another $10 million for a new and more reliable main fuel pump.

Senator **ANDREWS**. But nothing for thrust?

Mr. **DESANTIS**. They have not specified any additional dollars for increased thrust for the F-100.

Senator **ANDREWS**. Senator Rudman.

F-100/F-101 PERFORMANCE CHARACTERISTICS

Senator **RUDMAN**. Mr. Carlson, do you agree or disagree with General Burke looking at the first scale model, the standard F-16, that with no changes in inlet whatsoever the performance characteristics are essentially identical in the two aircraft, the F-100 and F-101, because of the F-101's increased weight?

Mr. **CARLSON**. Are you talking about this aircraft, sir?

Senator **RUDMAN**. Yes.

Mr. **CARLSON**. That particular aircraft with the standard thrust——

Senator **RUDMAN**. Standard inlet.

Mr. **CARLSON**. With standard inlet and the thrust of the F-100 versus the thrust of the F-101 DFE there will be some differences in the aircraft performance in the combat regime, specifically in acceleration time.

Senator **RUDMAN**. We saw the chart that General Burke portrayed for us and those performance differentials were relatively minor.

Do you agree with that on that airplane? We are not talking about a new inlet, but that airplane.

Mr. CARLSON. If you will specifically look at flight conditions like the time to accelerate from 0.8 mach to something over mach 1 at 30,000 feet, I think that the differential in time, even with the 254-pounds-per-second inlet, is very significant to anybody who is betting his life on the performance of that aircraft.

Senator RUDMAN. I think we will ask General Burke that for the record also. I think that is an important fact.

THRUST/WEIGHT RATIO

Assuming you were to receive funds to work on the thrust capability of your engine, would you assume that when you reach the point where you achieve comparable thrust that you would also have a weight increase?

Mr. CARLSON. I don't think that that is an assumption we would make at this time. Certainly we would do everything to bring about the increased thrust without a commensurate increase in weight that would destroy the very important 8-to-1 thrust to weight advantage that is so important in the current aircraft.

I believe that we could get the higher thrust and are moving in that direction. Our thought process is to be able to provide a 4,000 TAC cycle turbine and the increased thrust without a significant increase in weight We believe we have that technology in hand.

Senator RUDMAN. Because General Electric obviously made a design decision. We all know, whether we are building airplanes or automobiles, if you want to go for more weight you will get more durability. That generally is true.

METALLURGY STATE-OF-THE-ART

You are saying with the state-of-the-art that you have the metallurgy necessary to produce an engine essentially that will come in about at the same weight-to-thrust ratio as your current engine?

Mr. CARLSON. That is correct. If that would prove to be a problem in the fly-off competition we would be happy to be handicapped like they do at Belmont. We will hand the extra weight on the F-16 and fly it off.

It should be a point of interest to this committee in the proposed fly-off scheduled for 1982 the airplane on my far right, the 16E, will not be flying at the 48,000-pound gross level that the airplane is designed for.

So when evaluations come out of that particular fly-off let us bear in mind that the fly-off isn't at the maximum gross weight of the airplane needed to give it the air-to-ground combat capability that is sought.

Senator RUDMAN. I have, Mr. Carlson, just a general question because this committee is caught, as other members of Congress will be in a battle between two corporate giants. I understand the stakes involved for your two companies.

PRIOR IMPROVEMENT OF PRATT & WHITNEY ENGINE

I also think I understand the stakes involved for the Air Force which is frankly my primary concern. I want to simply ask you, as we look over the history of the last 5, 6, 7 years of this engine; can you tell me why Pratt & Whitney did not make a conscious decision on its own to start improving the engine, to improve the cycles that it could achieve?

I talk in terms of flight hours. Cycles are another matter. Of course you did some improvement, but obviously General Electric really got a long step up on you in terms of durability and reliability with their F-101.

Why didn't you on your own in a product improvement essentially eliminate the necessity or even the possibility of any competition?

Mr. CARLSON. That is an excellent question that I think should be asked and answered in this forum. Let us go back and if I may let me recall to everyone here, as I said earlier, that a TAC cycle was not even invented when the Air Force laid out the specifics for this particular engine.

Senator RUDMAN. But engine life was.

Mr. CARLSON. Engine life measured on the basis of the thermal fatigue that is brought about by TAC cycle that produce the abrupt temperature increases and decreases on the turbine blades and vanes, was not invented until 1975.

The requirement for a gas turbine engine to cope with a 4,000-TAC cycles didn't get identified and understood until the 1976-77 time frame. From that point on we understood that need and we have energetically pursued it.

GE certainly through the benefit of our experience up through 1975 and 1976 was able to start out with a clean sheet of paper. We had to start out with what we had in hand and improve it. We know how important it is to maintain those engines in the field.

Senator RUDMAN. Let me ask you one last question and I think we all have to leave.

WORLDWIDE JET ENGINE PURCHASES

I was interested in your synopsis of the relative percentages of the market in the military field. What is the general split in jet engine purchasing worldwide, civilian and military, between GE and Pratt & Whitney today?

Mr. CARLSON. The commercial engines being delivered in the competitive arena are going out this past 24 months at roughly 40 percent General Electric, 40 percent Pratt & Whitney, and 20 percent Rolls Royce and others. Those are the competitive engines that are being sold.

Senator RUDMAN. Ten years ago Pratt & Whitney had what, a 60 to 65 percent market share?

Mr. CARLSON. I presume that is about right.

Senator RUDMAN. Right now worldwide it is about equal, all sources?

Mr. CARLSON. On the competitive engines, on the ones that are competed.

Senator RUDMAN. It appears like GE is getting a leg up on military procurement from what you are saying to us today.

Mr. CARLSON. They have the bulk of the military engine business for the decade ahead. That has already been cast in concrete.

Senator **Rudman**. Pratt & Whitney has always been the pioneer in large jet engines and generally led the world with large jet engines. GE went for the small engines.

Mr. **Carlson**. Pratt & Whitney holds an edge in small jet engines that you see in commuters and in business aircraft. We do not have a significant amount of helicopter engine business.

Senator **Rudman**. Thank you very much, Mr. Carlson.

Mr. **Carlson**. Thank you, sir.

Senator **Andrews**. Thank you, Senator Rudman.

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until Thursday, May 27, at 10 a.m., when we will receive testimony on tactical aircraft issues.

[Whereupon, at 12:30 p.m., Tuesday, May 25, the subcommittee was recessed, to reconvene at 10 a.m., Thursday, May 27.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

THURSDAY, MAY 27, 1982

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:15 a.m., in room 1114, Everett McKinley Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Andrews, Rudman, Stennis, and Chiles.

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE AIR FORCE

STATEMENT OF LT. GEN. KELLY H. BURKE, USAF, DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION, DEPARTMENT OF THE AIR FORCE

ACCOMPANIED BY:

- **MAJ. GEN. ROBERT D. RUSS, USAF, DIRECTOR OF OPERATIONAL REQUIREMENTS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RD&A, USAF**
- **MAJ. GEN. JAMES H. MARSHALL, USAF, DIRECTOR OF DEVELOPMENT AND PRODUCTION, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RD&A, USAF**

TACTICAL AIRCRAFT ISSUES

OPENING STATEMENT OF SENATOR STEVENS

INTRODUCTION

Senator STEVENS. This is the time scheduled to take testimony from Air Force and Navy witnesses on the Defense Department's budget requests involving tactical aircraft. This will be a wide-ranging hearing, covering operating and support issues as well as usual funding questions rising from research, development and acquisition programs.

This is another of the issue-oriented hearings we are scheduling this year as part of the subcommittee's new approach to the budget. Unfortunately, we have a lot of ground to cover in a relatively short period of time, and it will be necessary for all of us to be brief and to the point.

BUDGET REQUEST

When we talk about tactical aircraft programs, we are in the area of big spending issues. For aircraft procurement alone, the Air Force request is $17.8 billion, up more than $3.7 billion from fiscal year 1982. Within the request, more than $5 billion is for tactical combat aircraft in fiscal year 1983.

For the Navy, the fiscal year 1983 request is $11.6 billion. This is up about $2.4 billion over the current year, and more than $7.3 billion of that is for combat aircraft.

One reason for these large increases is a massive expansion now programed for 1983 and beyond in the total force of tactical aircraft. The Air Force, for example, wants to go from 24 to 29 active fighter wings by the end of the decade, and the Navy proposes to increase its carrier wings from 12 to 14 by fiscal year 1987.

The tremendous costs, not only of developing and acquiring these aircraft but also of deploying and supporting them, represents a tremendous additional defense burden. I hope the witnesses today will deal with the need for this vast expansion in their opening presentations.

INTRODUCTION OF AIR FORCE WITNESSES

We will go first with the Air Force, and I am pleased to welcome back Lt. Gen. Kelly Burke, after an absence of 1 day. We seem to be taking a lot of your time, General. We will be pleased if you will introduce your colleagues at the table. We will print your statement in full in the record, and proceed with your opening presentation. I understand it will be comprehensive, but I hope you will be able to keep it within 15 minutes because of the limited time available to us.

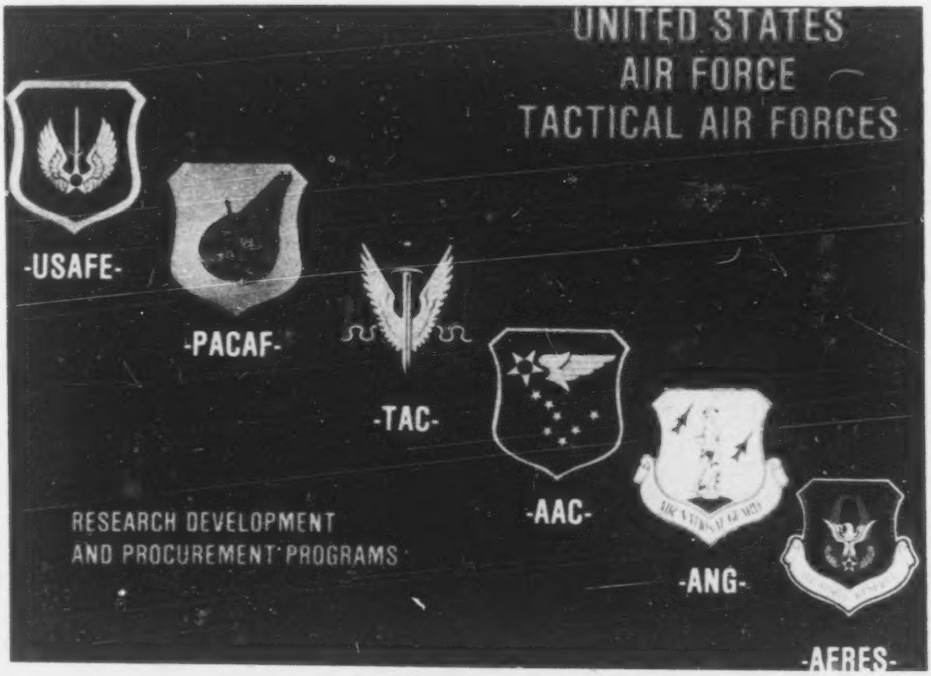
Do you intend to use slides this morning, also?

General **Burke**. Yes, Mr. Chairman, with your permission we would like to do that.

I have on my left Gen. Jim Marshall, and on my right, Gen. Bob Russ, both of whom have appeared before this committee many times before.

SLIDE PRESENTATION

I would just like to submit my statement for the record, if that meets with your approval, and move right into our presentation. We have a slide briefing which I think will put the Air Force's actual proposals in the proper perspective in context. Gen. Bob Russ is prepared to do that, if you are ready, sir.



UNITED STATES
AIR FORCE
TACTICAL AIR FORCES

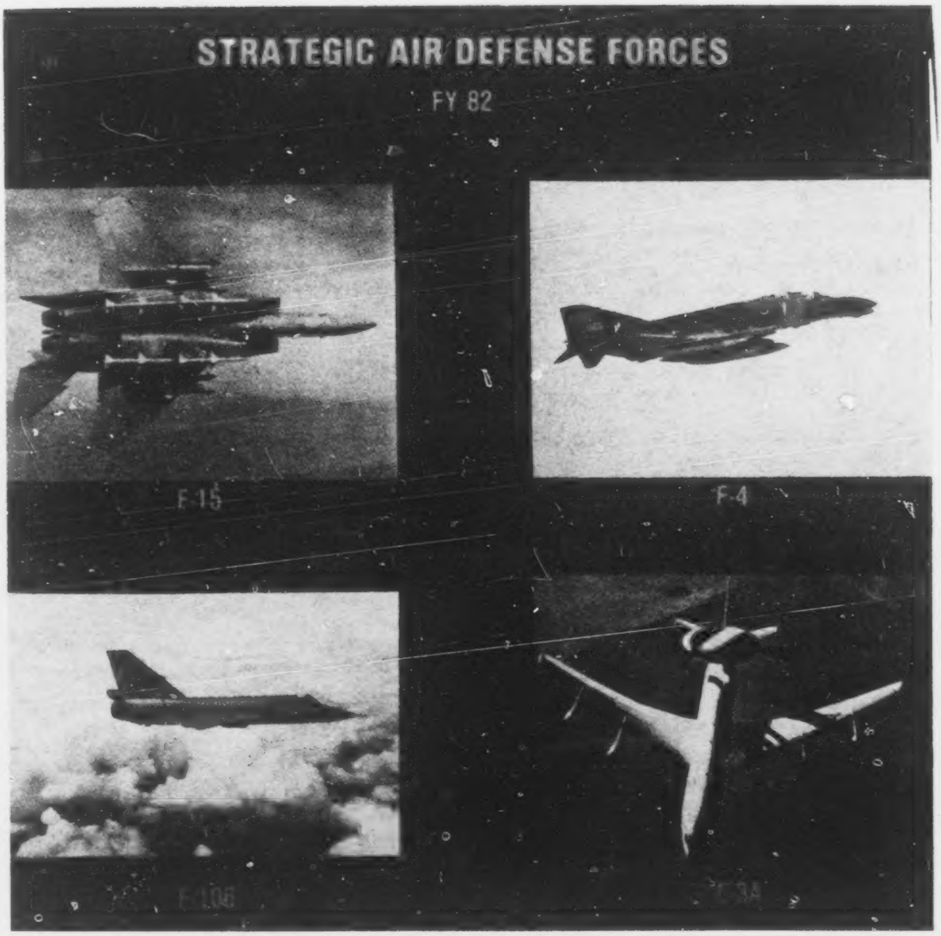
RESEARCH DEVELOPMENT
AND PROCUREMENT PROGRAMS

-USAFE-
-PACAF-
-TAC-
-AAC-
-ANG-
-AFRES-

SLIDE 1

STATUS OF AIR FORCE PROPOSALS

General RUSS. What I would like to do this morning is to cover, first, where we are today and then where we are going in the next several years and how the programs that we are procuring and developing affect these areas.



STRATEGIC AIR DEFENSE FORCES

FY 82

F-15
F-4
F-106
EA-3A

SLIDE 2

STRATEGIC AIR DEFENSE FIGHTER FORCES

To start off, let me talk about strategic air defense fighter forces. Sometimes those are separated from the fighter forces but certainly are a major portion of them.

CLASSIFIED CHART NO. 3

[Deleted From Transcript]

At the end of 1982 we will have F-4's, F-15's and F-106's in the Strategic Air Defense Forces and they will be supported by the EA-3A. We will have [deleted] aircraft. They will be divided into 15 squadrons, and 10 of those squadrons will be in the Air National Guard and 5 will be in the active forces. The first F-15 squadron will have been introduced in the Air Defense forces and that will be at Langley Air Force Base, Va. That will be our first antisatellite squadron.

STRATEGIC AIR DEFENSE FORCES

FORCE OBJECTIVES

- IMPROVE WARNING AND SURVEILLANCE
- MODERNIZE AIR DEFENSE FIGHTERS

MODERNIZATION PLAN

- PROCURE ADDITIONAL E-3A AIRCRAFT
- REPLACE ACTIVE F-106 SQUADRONS WITH F-15s
- REPLACE ANG F-106 SQUADRONS WITH F-16s

SLIDE 4

GOALS AND OBJECTIVES

When we laid down our goals and force objectives, we came up with two major items: First was to improve our warning and surveillance; and second was to modernize our air defense fighter forces.

Senator ANDREWS. What do you mean by antisatellite squad? That went over my head. How do you use a plane to attack a satellite?

General RUSS. Sir, we are programed to use the F–15 squadron at Langley and the F–15 squadron at [deleted] to shoot down satellites. They will have a weapon that is carried underneath the aircraft on the centerline that has a homing device, built on a SRAM motor that will be fired from altitude.

The F–15 will fly to [deleted] feet, accelerate, pull up and fire the weapon and it will go up and intercept the satellite.

General BURKE. We expect to be demonstrating that fairly soon, Senator. That program is coming along quite well. The F–15 is the first stage of the rocket launch. The advantage is that you can send that F–15 to whatever area is advantageous.

Senator ANDREWS. This gets to normal satellite-operating heights?

General BURKE. Yes, sir, the F–15 takes it up to like [deleted]. The next stage happens to be a SRAM missile stage and the final stage is an ALTAIR rocket motor; that gets the lethal system up to satellite orbiting altitude.

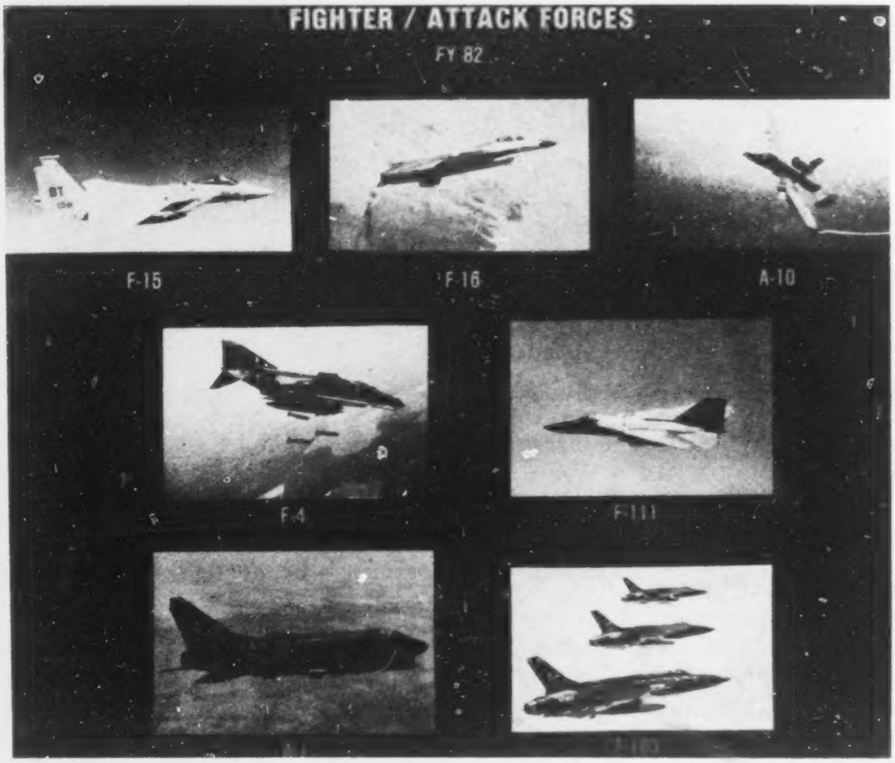
MODERNIZATION OF AIR DEFENSE FIGHTERS

General RUSS. The second force objective is to modernize the air defense fighters. We are planning to retire the active F-106 force and replace them with F-15's and the Reserve F-106's with F-16's.

CLASSIFIED CHART NO. 5

[Deleted From Transcript]

By 1988 this is what the force will look like, increased up to [deleted] aircraft. We will still have the 15 fighter squadrons. The Active force will have five squadrons of F-15's. The Air National Guard will be fully modernized with five squadrons of F-16's.



SLIDE 6

FIGHTER AND ATTACK FORCES

Looking now at the fighter and attack forces, at the end of this year we will have seven different types of aircraft in the inventory. Throughout the timeframe they will all remain in the force in various quantities, with the exception of the F-105 which will be phased out, and I will show that in a minute.

CLASSIFIED CHART NO. 7

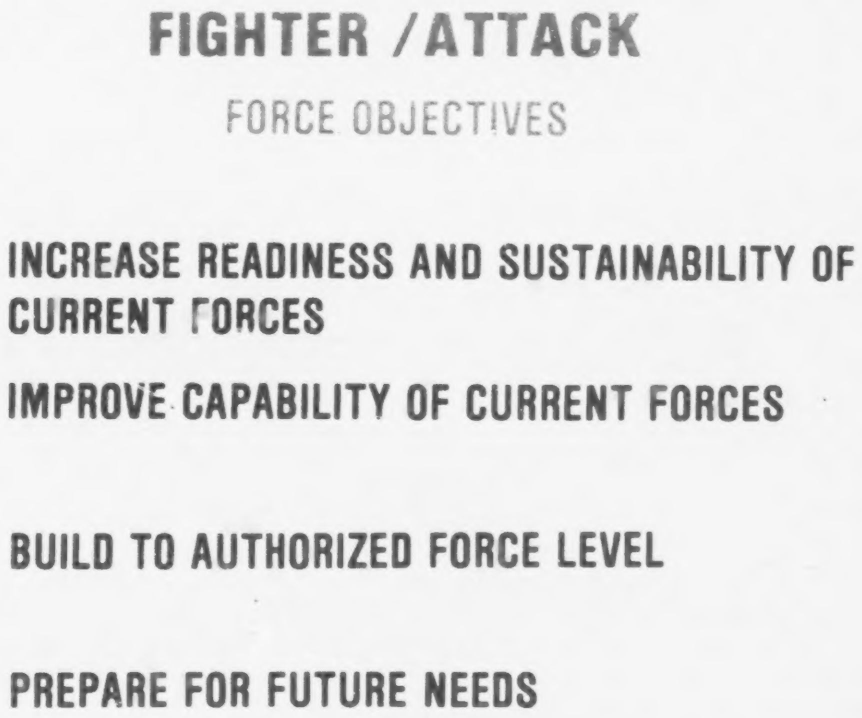
[Deleted From Transcript]

That force is broken down as shown on this slide. We have slightly under [deleted] aircraft.

One-third of the force is in the Reserve and the Air National Guard. Two-thirds of the fighter attack force is in the Active.

The F-4 force is split between the Active and Reserve.

The A-7's are entirely in the Reserve and the A-10 is split between the Active and the Reserve.



FIGHTER /ATTACK

FORCE OBJECTIVES

INCREASE READINESS AND SUSTAINABILITY OF CURRENT FORCES

IMPROVE CAPABILITY OF CURRENT FORCES

BUILD TO AUTHORIZED FORCE LEVEL

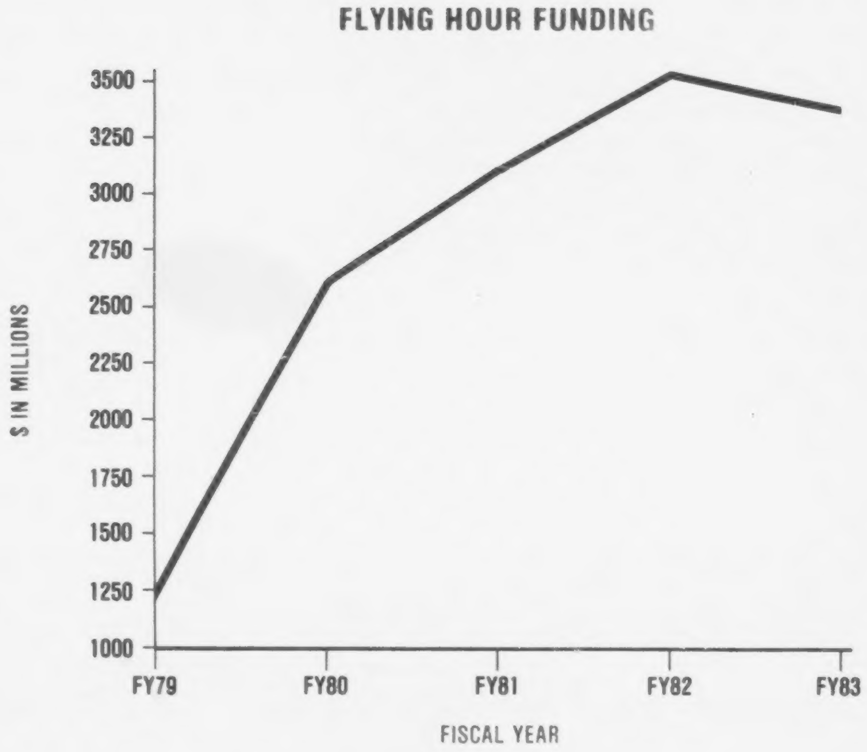
PREPARE FOR FUTURE NEEDS

Slide 8

MAJOR FORCE OBJECTIVES

These are the four major force objectives we laid down when we developed our objectives for our Fighter Attack Force.

First and most important was to increase the readiness and sustainability of our current forces. The second was to improve the capability of those forces; then we want to build to our authorized force levels, recognizing we are short of our authorization today; and, finally, we want to prepare for our future needs.



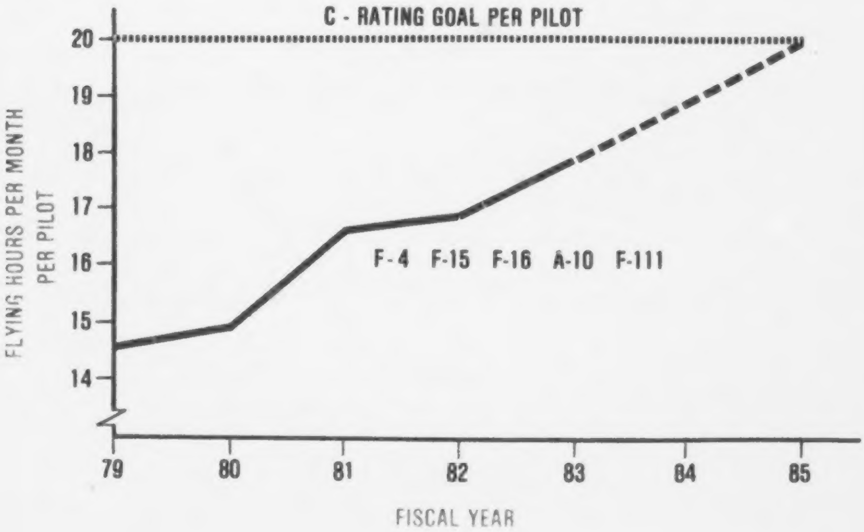
SLIDE 9

FLYING HOURS

Now, on the readiness and sustainability. One of the best measures of readiness is flying hours. This slide shows where we have been. In 1979, $2 billion was invested in flying hours. You can see the major increase in funding that has been provided for flying hours. I must say a lot of that has to do with the cost of fuel and specifically the downturn up here also represents the fuel change.

FIGHTER/ATTACK PILOTS

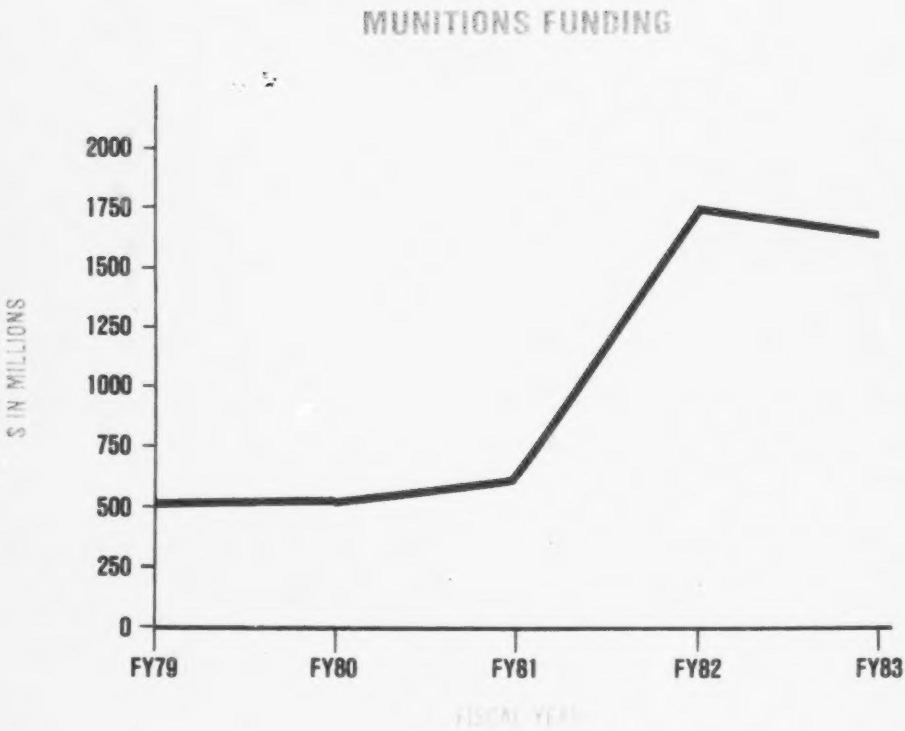
AVERAGE FLYING HOURS PER MONTH



Slide 10

A better measure of that is how many flying hours are the pilots getting. This chart shows that. It shows the average flying hours per month. Back in 1979 we were getting about 14.5 hours per pilot. We have set out on a program, as shown here, to reach about 20 hours per month in 1985. That is our goal. By 1983 we will be slightly under 18.

Now, you recognize and I recognize that 20 hours is not the same for all the airplanes. Right now we are flying the A-10 over 20 hours, the F-111 down to 14 or 15 hours. On the average we will reach the 20 hour goal in about 1985.



Slide 11

MUNITIONS FUNDING

A second major area is munitions funding. It was fairly stable from 1979 to 1981 at about the $500 million level. [Deleted.] We invested significant amounts and now we are pretty well stabilized.

CLASSIFIED CHART NO. 12

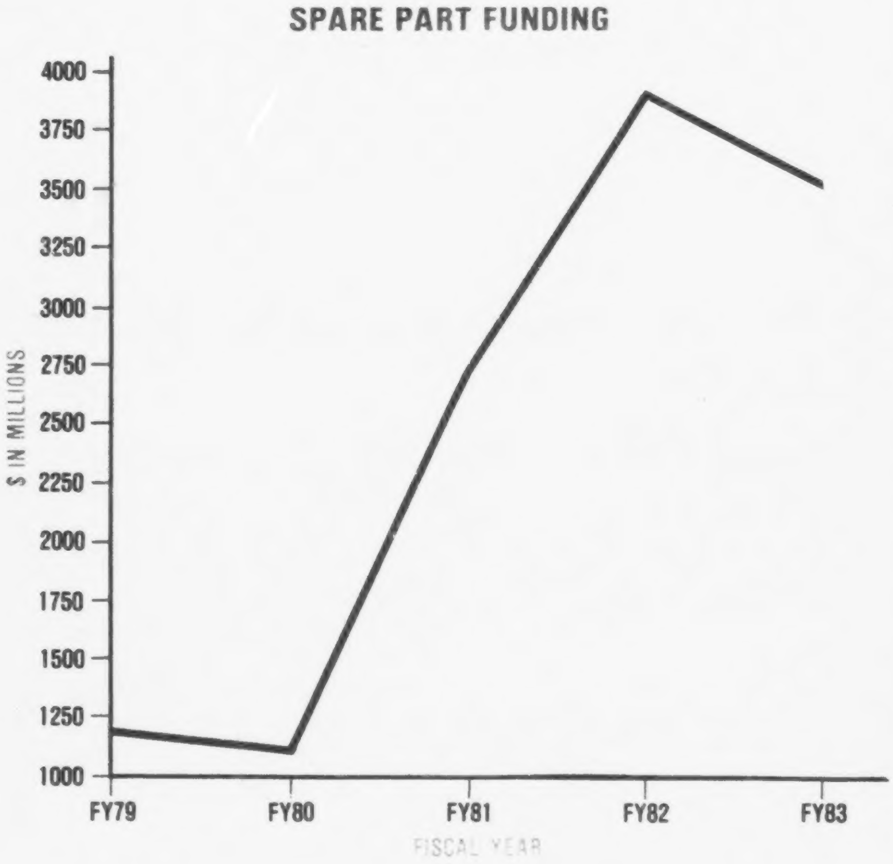
[Deleted From Transcript]

Let me show you what that does: This chart shows our requirement versus the funding for air-to-air missiles. Here is 100 percent of our requirements. This line shows that in 1981 we had about [deleted] of our requirements funded. By the 1987 time frame we will have [deleted] requirements for air-to-air missiles. That line is a composite line that includes AIM-7, AIM-9 and AMRAAM.

CLASSIFIED CHART NO. 13

[Deleted From Transcript]

In the air-to-ground area, our 60-day requirement versus funding is shown on this chart. It shows that in 1981 we had [deleted] of our requirement. I must say that [deleted]. What I mean by that is [deleted]. Those are the [deleted]. We would desire to have a more preferred munitions mix ratio. The types of preferred munitions I am talking about are optical bombs, Maverick, the smart sort of weapons that we are currently building. So, we feel that that program is moving along rapidly.



SLIDE 14

SPARE PARTS FUNDING

In the spare parts funding, another measure of our readiness and sustainability, this shows that we were underfunded in 1979 and 1980, and had a dramatic increase in 1981 and 1982. We pretty well have gotten the backlog down in 1983.

CLASSIFIED CHART NO. 15

[Deleted From Transcript]

This is what that looks like in our three major areas of spare parts. As you know, the peacetime operating supplies are what we use in our day-to-day operation. We will have fully funded those 100 percent, by 1983. Our wartime readiness kit allows us to go out to our first [deleted] of combat. They will be [deleted].

Our other war readiness material will be [deleted]. We believe that this program is well structured.

FIGHTER /ATTACK

FORCE OBJECTIVES

INCREASE READINESS AND SUSTAINABILITY OF CURRENT FORCES

IMPROVE CAPABILITY OF CURRENT FORCES

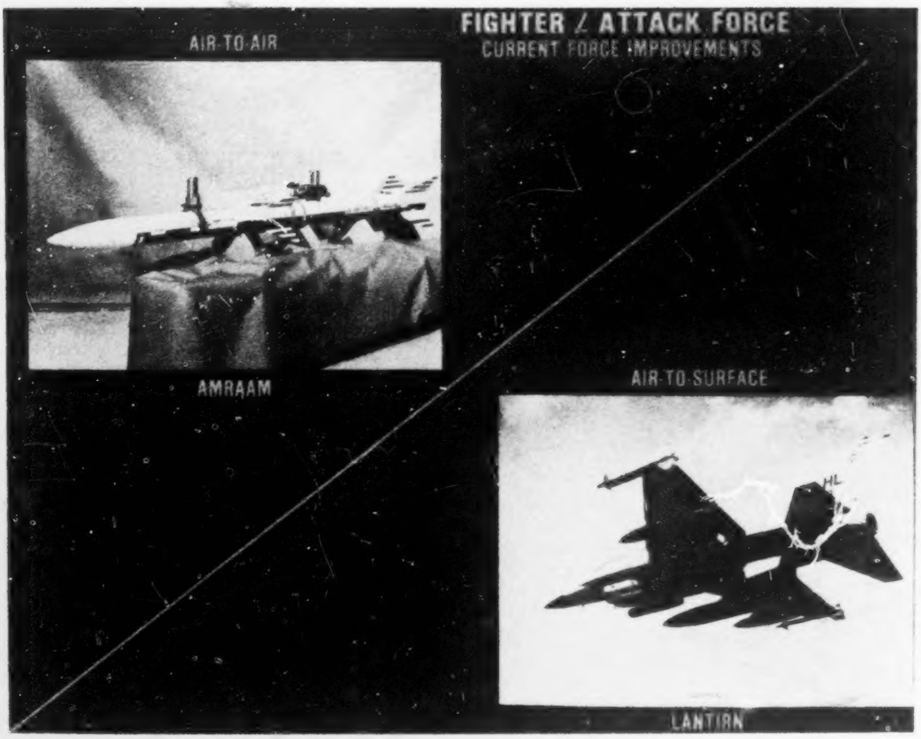
BUILD TO AUTHORIZED FORCE LEVEL

PREPARE FOR FUTURE NEEDS

Slide 16

CURRENT FORCE CAPABILITY IMPROVEMENT

The second point that I want to discuss is improving the capability of our current force, and in doing that let me look at the air-to-air area and the air-to-surface area, and let me address one program in each area.



FIGHTER / ATTACK FORCE

CURRENT FORCE IMPROVEMENTS

AIR-TO-AIR

AMRAAM

AIR-TO-SURFACE

LANTIRN

SLIDE 17

AMRAAM

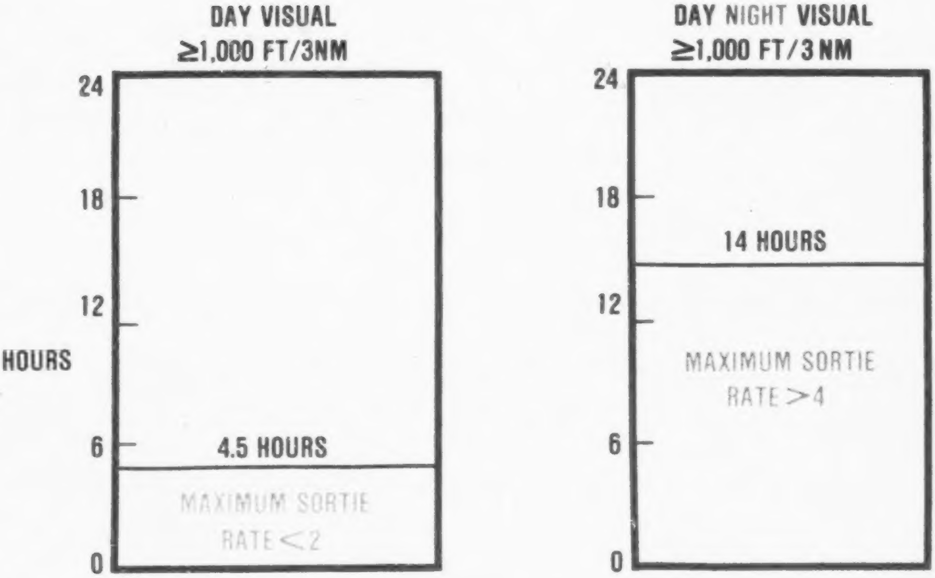
The AMRAAM—Advanced Medium Range Air-to-Air Missile—is ordnance for the F–15 and the F–16. Currently, today we don't have an all-weather missile for the F–16; therefore, it lacks a very good capability. I will show you with a chart in a minute what the weapon will do for us.

LANTIRN PROGRAM

Let me say in the air-to-surface area the most important program we have is the LANTIRN program, which is there to provide us a night window, allowing us to operate at night and under the weather. Here is what that means.

CONDITIONS OF COMBAT

THE OPERATING WINDOW -- CENTRAL EUROPE
JANUARY



SLIDE 18

CENTRAL EUROPE WEATHER

This chart represents the weather in Central Europe in January. I picked January specifically to make a point. I recognize January is the worst month, but the same point of this chart is applicable to other months to a different degree. What this means is that in January, with day visual type conditions for a day visual airplane like today's F-16, you only have 4.5 hours total during that day that you can fly that airplane. If you only have 4.5 hours totally, you can only fly two sorties a day.

If you are given a night capability, you increase the window to 14 hours and you can fly double the number of sorties.

We believe the leverage you receive by giving us night capability is significant and certainly worth the price.

CLASSIFIED CHART NO. 19

[Deleted From Transcript]

This is what we have when we add that kind of capability. Today, for all environments or all-weather capability, all we have is the F-111. We have 240 of those. [Deleted.]

The night under the weather capability will be introduced on the A-10 and the F-16. By [deleted] we will increase our capability significantly, but we still have a vast majority of our force that does not have night capability.

CLASSIFIED CHART NO. 20

[Deleted From Transcript]

In the AMRAAM, advanced medium-range air-to-air missile, today only the [deleted]. The F-4 has an all-weather missile but the F-16 does not; it is primarily a day fighter. By [deleted] we will have started to introduce the AMRAAM into the F-16 fleet and improve our air-to-air capability.

FIGHTER /ATTACK

FORCE OBJECTIVES

INCREASE READINESS AND SUSTAINABILITY OF CURRENT FORCES

IMPROVE CAPABILITY OF CURRENT FORCES

BUILD TO AUTHORIZED FORCE LEVEL

PREPARE FOR FUTURE NEEDS

Chart 21

BUILDING TO AUTHORIZED FORCE LEVEL

Our third objective was to build to the authorized force level.

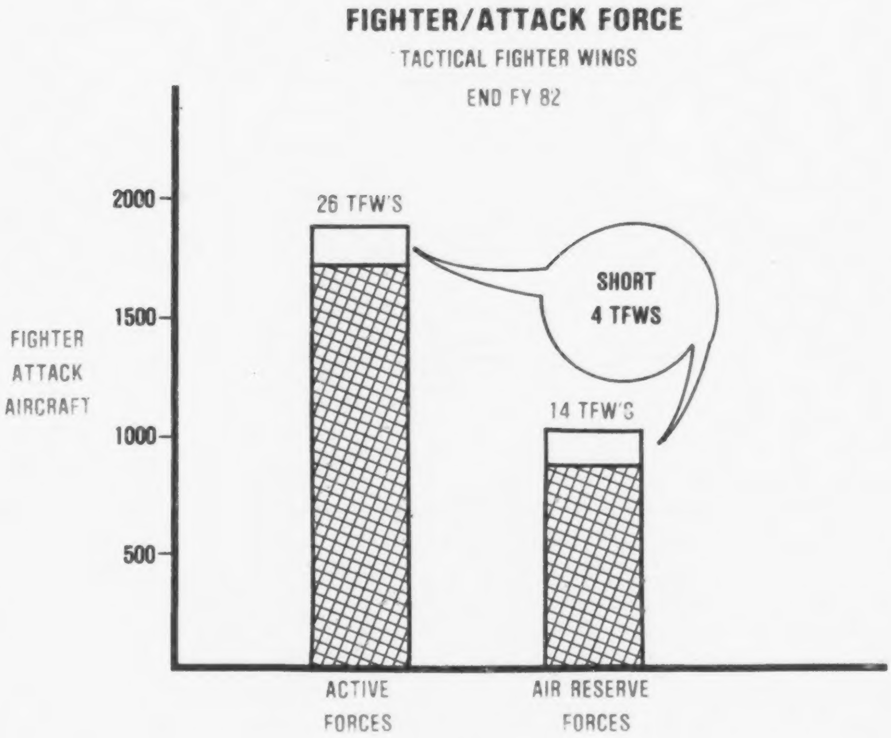
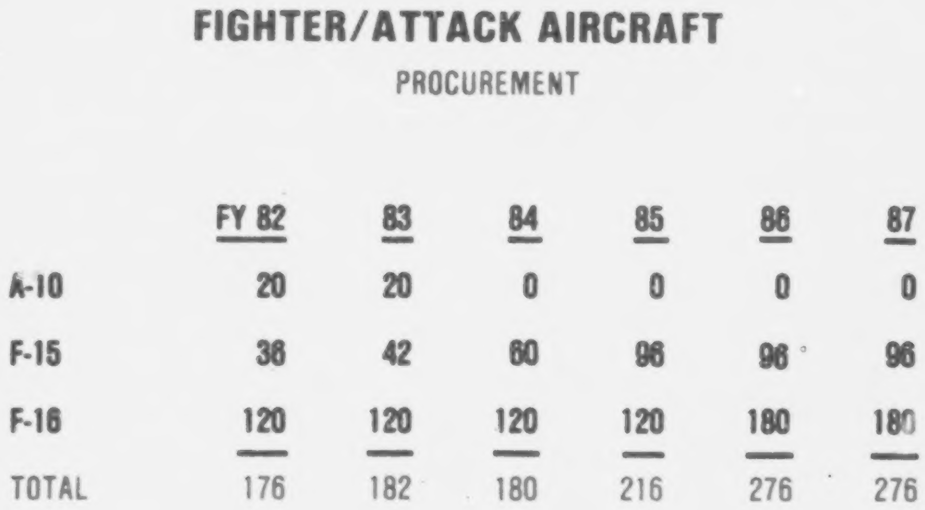


CHART 22

TACTICAL FIGHTER WINGS

As you know, today we are authorized 40 tactical fighter wings, 26 fighter wings in the Active Forces, 14 fighter wings in the Reserve Force. However, we do not have sufficient airplanes to fully equip those forces. We have the equivalent of a four-tactical fighter wing shortage in airplanes.



FIGHTER/ATTACK AIRCRAFT

PROCUREMENT

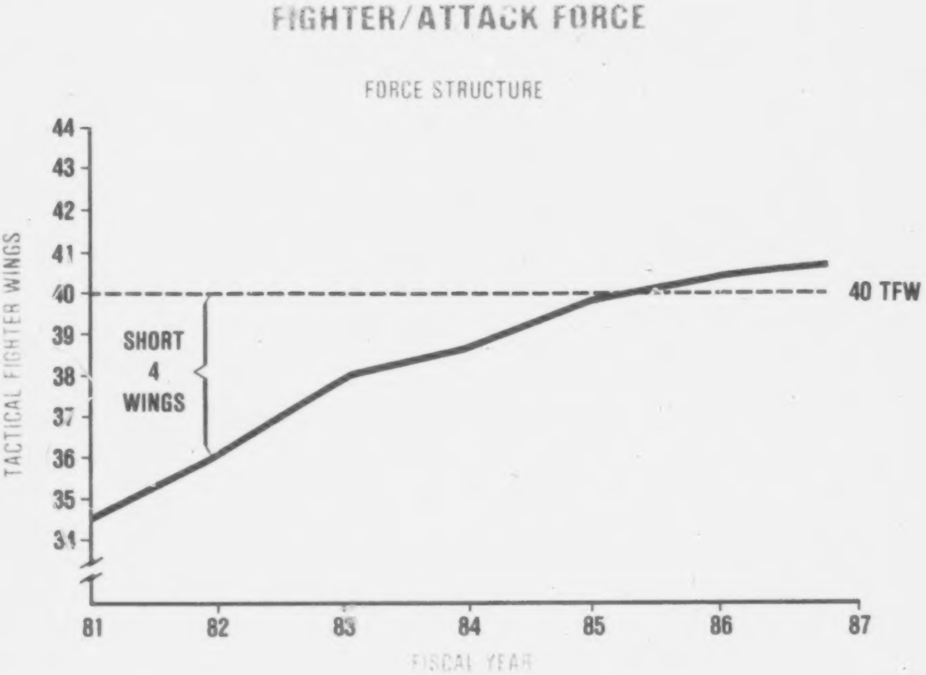
	FY 82	83	84	85	86	87
A-10	20	20	0	0	0	0
F-15	36	42	60	96	96	96
F-16	120	120	120	120	180	180
TOTAL	176	182	180	216	276	276

SLIDE 23

PROCUREMENT PROGRAM FOR FISCAL 1983 BUDGET

This is the procurement program that we have laid out. This is the 1983 budget which you have before you now. In the A-10 area, we plan to buy 20 in 1983. The F-15 will continue out to the timeframe shown, building to 96, which is a more economical rate.

The F-16 is on a 4-year multiyear contract at 120 per year. It will take us to 1985 and then we will step it up to 180 in 1986. We would like to have around 250 airplanes per year. We need that number to keep the force at a level of 40 wings. You crash a certain number of airplanes a year and the others age out. The desired average age of a fighter is 9 to 10 years. If the airplane stays in the inventory for 20 years, we phase it out, and to replace those airplanes and replace the ones we crash, it takes 250 a year.



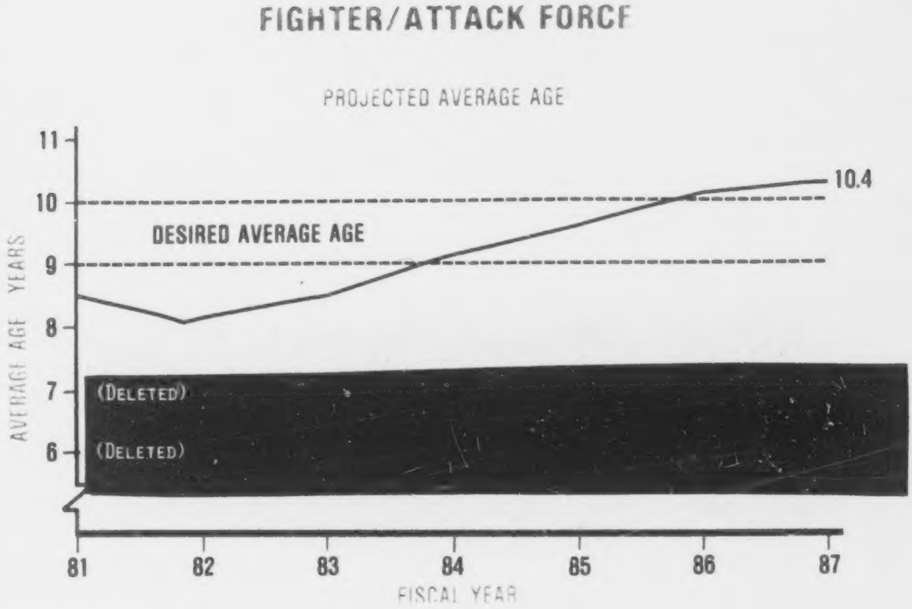
FIGHTER/ATTACK FORCE

FORCE STRUCTURE

Slide 24

RESULT OF PROCUREMENT ON FORCE STRUCTURE

With that procurement, here is what it does to our force structure. Here is where we are at the end of 1982, four wings short. That procurement buy will take us up to this line, and in 1985 we will have 40 tactical fighter wings. As you know, our goal is 44 tactical fighter wings, but that is at the end of 1990.



SLIDE 25

AGE OF AIRCRAFT

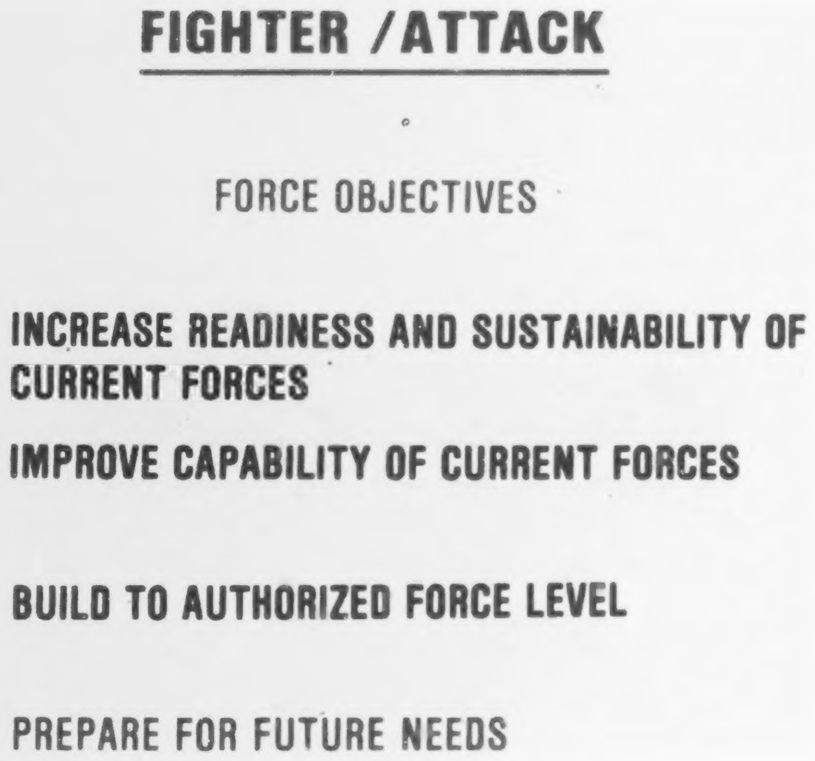
Now, that has not come cheaply. Here is what happens: We pay for that in the average age of our airplanes. Back in 1982 the age of our aircraft was about 8 years; that has continually grown during the time frame to 10.4 years. Like I said, we would like to keep the average age between 9 and 10 years.

I think it is significant to note how our adversaries are doing. [Deleted.] They not only have the quantity on us but also they have the average age which reflects newer airplanes.

CLASSIFIED CHART NO. 26

[Deleted From Transcript]

At the end of 1987 this is what the force will look like. We still will have one-third of the force in the Air National Guard and the Reserves. We have F-16's in the National Guard and still have the basic split of F-4's , A-7's, and A-10's. We will have phased out the F-105's, the oldest airplanes, from the inventory.



FIGHTER /ATTACK

FORCE OBJECTIVES

INCREASE READINESS AND SUSTAINABILITY OF CURRENT FORCES

IMPROVE CAPABILITY OF CURRENT FORCES

BUILD TO AUTHORIZED FORCE LEVEL

PREPARE FOR FUTURE NEEDS

Slide 27

FUTURE NEED PREPARATION

The last objective was to prepare for future needs.

In that area, we are really looking at two things: We are looking at a midterm objective and long-term objective.

F-15/F-16 DERIVATIVE AIRCRAFT

F-15E

F-16E

TACTICAL COMMANDERS IDENTIFIED REQUIREMENT
FOR 400 LONG RANGE, DUAL-ROLE FIGHTERS TO
REPLACE AGING F-4s

Slide 28

CANDIDATES FOR F-4 REPLACEMENT

In the midterm objective the requirement is to [deleted] long-range, dual-role fighters to replace aging F-4's. The two candidates to do that are the F-15E and the F-16E. I say long-range, dual-role fighter. Those are important words. Let me show you why I say long range.

CLASSIFIED CHART NO. 29

[Deleted From Transcript]

This represents a target structure in Europe. This represents the number of airfields in Central Europe that we would like to bomb. This says that an F-111 in the United Kingdom could strike some [deleted] of those targets. It says an F-4 based in Germany could strike about [deleted] of those targets.

What we are trying to do is buy that E model, which is a derivative of the F-15 or the F-16. You can see the range payload of that airplane will allow us to cover [deleted]. It also becomes very pronounced when we get to Southwest Asia and other areas of the world where we have long target ranges.

Senator Stevens. Where are you flying those from?

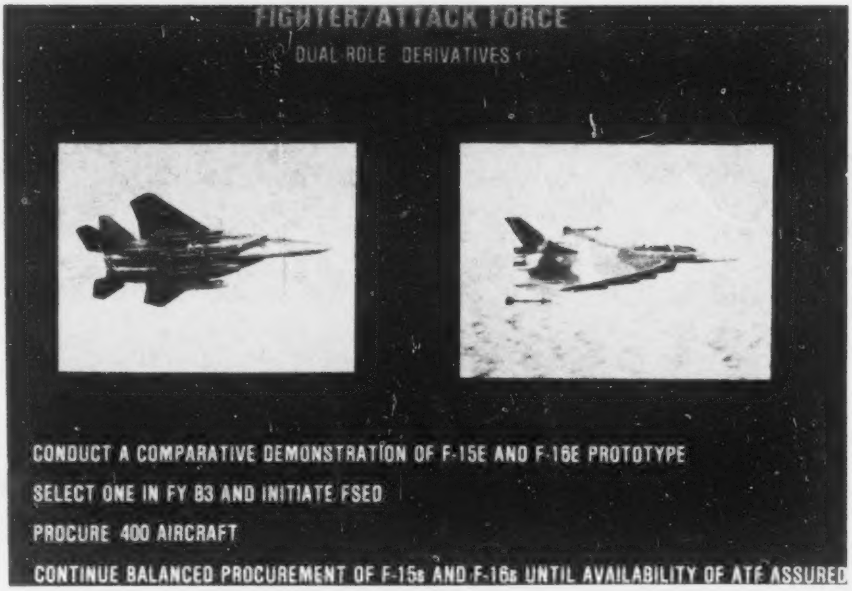
General Russ. These are being flown from the United Kingdom; these are being flown from Germany; and these are being flown from Germany (indicating on slide). These airplanes will replace these, of course.

CLASSIFIED CHART NO. 30

[Deleted From Transcript]

This is where they fit in. As I said, when the F-4 becomes 20 years old, we phase them out. If you look out into the 1986, 1987, and 1988 timeframe, you will see how these start to phase out. During the Vietnam conflict is when all of the F-4's came in and 1987 is when they have to start to go out of the fleet.

Here is where we start in with the E derivative, [deleted] of them.



FIGHTER/ATTACK FORCE

DUAL ROLE DERIVATIVES

CONDUCT A COMPARATIVE DEMONSTRATION OF F-15E AND F-16E PROTOTYPE

SELECT ONE IN FY 83 AND INITIATE FSED

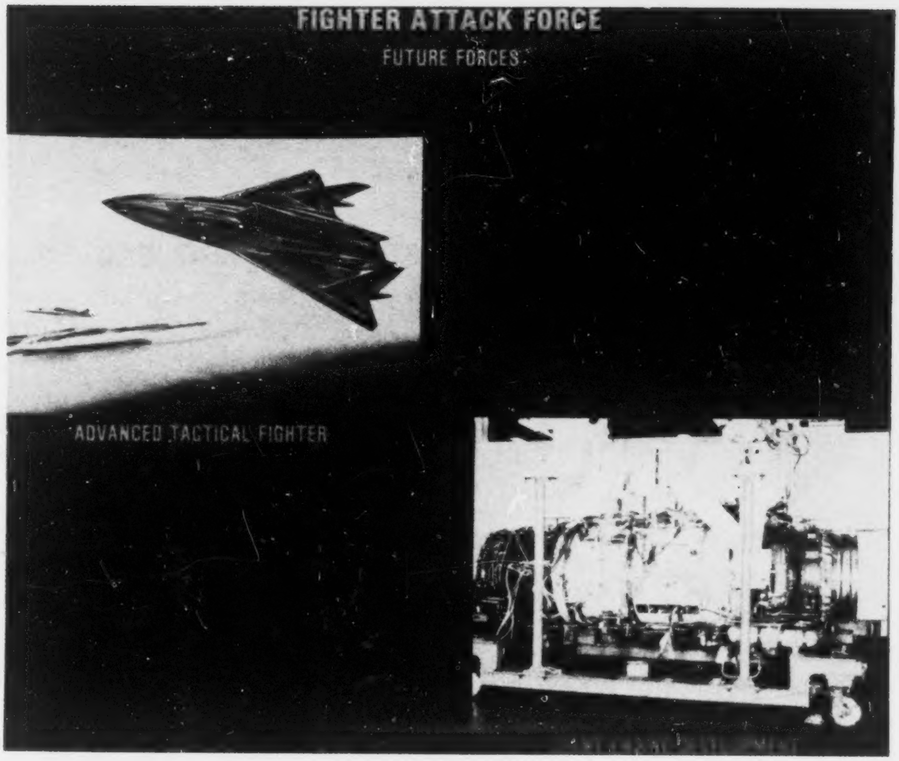
PROCURE 400 AIRCRAFT

CONTINUE BALANCED PROCUREMENT OF F-15s AND F-16s UNTIL AVAILABILITY OF ATF ASSURED

SLIDE 31

OBJECTIVES

These are our objectives. We are going to conduct some comparative demonstrations of the F-15E and F-16E prototypes. We will select one in 1983 and initiate full-scale development, and we will buy [deleted]. We want to procure a balance of the F-15's and F-16's until an advanced tactical fighter is assured. When that advanced tactical fighter comes in depends on when we get started.



FIGHTER ATTACK FORCE

FUTURE FORCES

ADVANCED TACTICAL FIGHTER

SLIDE 32

2-PART PROGRAM

If we start in 1983 with the money we have in the budget, we would not be able to put a new advanced fighter into the inventory until 1993 at the earliest. It took us between 10.5 and 12 years to develop the F-15 and the F-16 and the A-10; 10.5 years puts it in the 1993-95 timeframe which is as soon as we can get a new fighter.

The program we have laid out in our request this year is in two parts: It is part for the aircraft and part for the engine. We discussed a little bit about the engine the other day. This is a joint engine development that we would hope that the Air Force and the Navy will use in the future fighter.

This is the aircraft, an artist's conception of what we are looking at. We see some high payoff in the new type of airplane.

FIGHTER/ATTACK FORCE

SUMMARY PLAN

TODAY

INCREASE READINESS AND SUSTAINABILITY OF CURRENT FORCE

NEAR TERM (BY 1987)

IMPROVE CAPABILITY OF CURRENT FORCES BY DEVELOPING AND FIELDING A NIGHT/ADVERSE WEATHER CAPABILITY

FLESH OUT 40 TFW'S BY CONTINUED PROCUREMENT OF F-15s AND F-16s

INITIATE PROCUREMENT OF A DERIVATIVE FIGHTER (F-15E OR F-16E) TO REPLACE AGING F-4s

LONG TERM (POST 1987)

DEVELOP AND PROCURE AN ADVANCED TACTICAL FIGHTER TO MEET THE 1990's THREAT

CONTINUE BALANCED PROCUREMENT OF F-15s AND F-16s UNTIL AVAILABILITY OF ATF IS ASSURED

SLIDE 33

SUMMATION OF PRESENTATION

Summing it all up then, today our major effort is to increase the readiness and sustainability of the current force. By 1987 we are going to improve the capability of that force by giving it a night and adverse weather capability, with the LANTIRN system and also with the AMRAAM capability on the F–16; then we are going to fill out our 40 tactical fighter wings by buying F–15's and F–16's.

We will start procurement of the E model. In the long term we want to develop that advanced tactical fighter and continue balance of the procurement of F–15's and and F–16's until we have that aircraft.

[The prepared statement of General Burke follows:]

PREPARED STATEMENT OF LT. GEN. KELLY H. BURKE

DEPUTY CHIEF OF STAFF

RESEARCH, DEVELOPMENT AND ACQUISITION

HEADQUARTERS, U.S. AIR FORCE

Mr. Chairman and Members of the Committee,

I am proud to present the Tactical Air Forces Procurement and Research, Development, and Test and Evaluation (RDT&E) budget request for Fiscal Year 1983.

Today the greatest threat we face is clearly the Soviet Union. While there are certainly other threats to American interests, only the Soviets have the capability to threaten our survival as a nation. They have concentrated a major portion of their natural resources on an unprecedented arms buildup which shows no signs of abating.

Although our Tactical Forces must be able to fight on any number of fronts, the major conventional threat we must be prepared to counter is an attack on Western Europe by the numerically superior forces of the Warsaw Pact. Pact doctrine is intended to cause the quick collapse of NATO Forces through massed attacks. Rapid movement of their forces, including operations at night and during periods of bad weather, is the key to their intended success.

To counter this scenario, NATO depends heavily on the flexibility and responsiveness of tactical aircraft to bring power to bear rapidly in threatened sectors. Equally critical is the capability to harass and destroy the enemy's supply lines and airfields, while maintaining local air superiority and defending our bases from airborne attack.

To meet the Soviet challenge, we have constructed a plan to increase the readiness and sustainability of our current forces while modernizing to maintain our qualitative edge.

In order to better train our aircrews we are increasing aircrew flying hours as well as the maintenance capability to sustain peacetime flight operations. We expect to reach our required level of war readiness supplies before the end of the planning period. Our plans also include the acquisition of sufficient numbers of AIM 7 and AIM 9 air-to-air missiles to meet our inventory objectives. In the area of air-to-surface weapons, we are taking action to build up our stockpile of preferred anti-armor munitions to replace our current inventory of World War II type "iron bombs" which is sufficient in numbers but does not have the needed capability.

We are continuing a balanced procurement of fighter/attack aircraft to replace our older, outdated and difficult to maintain aircraft such as the F-106, which is currently about 22 yrs old. In fact we have already begun replacing the F-106 as part of our strategic air defense modernization. The first squadron is currently transitioning to F-15s at Langley AFB, VA.

We will complete our planned A-10 buy of 727 aircraft with the procurement of 20 aircraft in FY 1983. As of January 31, 1982 we had accepted 586 of these specialized close air support aircraft. All six of the planned USAFE squadrons are now operational. Four of the five planned Air National Guard squadrons are operational, as are two of four Air Force Reserve squadrons. The balance of the squadrons will be operational in FY 1983. This is one of the few occasions that substantial numbers of new first line combat aircraft have been delivered to active, guard, and reserve units concurrently.

The FY 83 budget raises F-15 production to a more efficient rate and provides for advance procurement to support even more efficient rates in FY 84. As of January 31, 1982 we had accepted

620 aircraft and have activated 16 of 20 operational squadrons. We plan to continue to procure F-15s to correct deficiencies in strategic defense, modernize tactical forces and reach force structure goals.

We plan to buy 120 F-16s in FY 83 under a multiyear contract. These aircraft will help flesh out active forces and modernize the Air Reserve Forces. Our plan includes a request for 1445 aircraft through FY 1987 with more to follow in later years. As of January 31, 1982 we had taken delivery of 365 production aircraft and activated 12 operational squadrons.

We need to procure about 280 fighter aircraft each year to sustain a force capable of meeting mission requirements. We plan to achieve this annual procurement goal in FY 1986.

Our aircraft RDT&E emphasis is on increasing the all weather capability of our fighters. We are incorporating the Low Altitude Navigation and Targeting Infrared System for Night (LANTIRN) and radar improvements as part of the F-16 Multinational Staged Improvement Plan (MSIP). The LANTIRN system will extend our operational capability into night under-weather conditions. This will more than double our potential sortie rate during typical winter weather conditions in Central Europe. LANTIRN will also permit low level ingress to avoid enemy defenses.

For increased air-to-air capability we plan to incorporate the Advanced Medium Range Air-to-Air Missile (AMRAAM) on both the F-15 and F-16. We are also stressing the development and integration of Beyond-Visual-Range (BVR) aircraft identification technology into our aircraft to fully exploit our existing and future medium range missile capability.

The AMRAAM will provide significant improvements over current systems by employing technology which gives it a high rate of kill probability from standoff ranges rather than being drawn into close-in dogfights. AMRAAM will give pilots an improved chance to win engagements, even if outnumbered, by attacking multiple threats before they can launch their own missiles. The first production delivery of AMRAAM is expected in late FY 85. Also the Navy plans to equip both the F-14 and F-18 with AMRAAM.

Both LANTIRN and AMRAAM are critical to our efforts to deny the night weather sanctuary to an increasingly sophisticated threat.

In addition to AMRAAM we are pursuing a number of other weapon programs to increase our combat effectiveness. We are improving existing weapons such as the Maverick missile and are developing a variation of the Laser Guided Bomb for Low Altitude Delivery. The Low Level Laser Guided Bomb (LLLGB) expanded launch envelope allows for low level attack of fixed, high value, point targets such as bridges and tunnels. We are planning to procure the Imaging Infrared (IIR) Maverick to expand our capability to destroy small, hard targets during night and limited visibility conditions. It will complement the daylight only TV Maverick currently in the inventory and the laser version being developed for the Marine Corps.

A weapon under joint development with the Navy is the Medium Range Air-to-Surface Missile (MRASM). It is a conventionally armed cruise missile which will give aircraft the capability to engage high value targets, such as airfields and ships, while standing off beyond the range of enemy point defenses.

Returning to our fighter programs, we will conduct a comparative evaluation of F-15/F-16 derivatives to determine which candidate is the best platform to fulfill our requirement for a dual role fighter to conduct long-range strike/attack missions. The derivative program will allow us to expand upon the inherent air-to-surface capabilities of the F-15/F-16, replace the aging F-4 and augment the fully committed and attritting F-111 force.

To counter the 1990's threat we are planning to develop an Advanced Tactical Fighter (ATF). In FY 1983 we will begin work needed to ensure that potential solutions are adequately evaluated prior to full scale development in 1987. Engines have traditionally had the longest development cycle of all fighter components so we have included advanced engine development in the ATF program.

Soviet air defense systems continue to grow in density, quantity and complexity as the Soviets develop and deploy new tactical and strategic air defense systems. These new systems emphasize mobility and use both radar and electro-optical means for target acquisition and tracking. Growth in their air defense capability has also been marked by increased reliance on command, control, and communications (C^3) as they strive to maintain a highly reliable, efficient, and integrated system.

Because of this growing threat, we have and will continue to place considerable emphasis on electronic combat. Our objective is to achieve a mix of systems which disrupt, degrade, deceive, or destroy an enemy's air defense network in order to ensure the survivability of our aircraft and aircrews. To accomplish this, we have programmed updates for our operational defense suppression systems, as well as continued development of several new systems to handle the highly sophisticated Soviet threat.

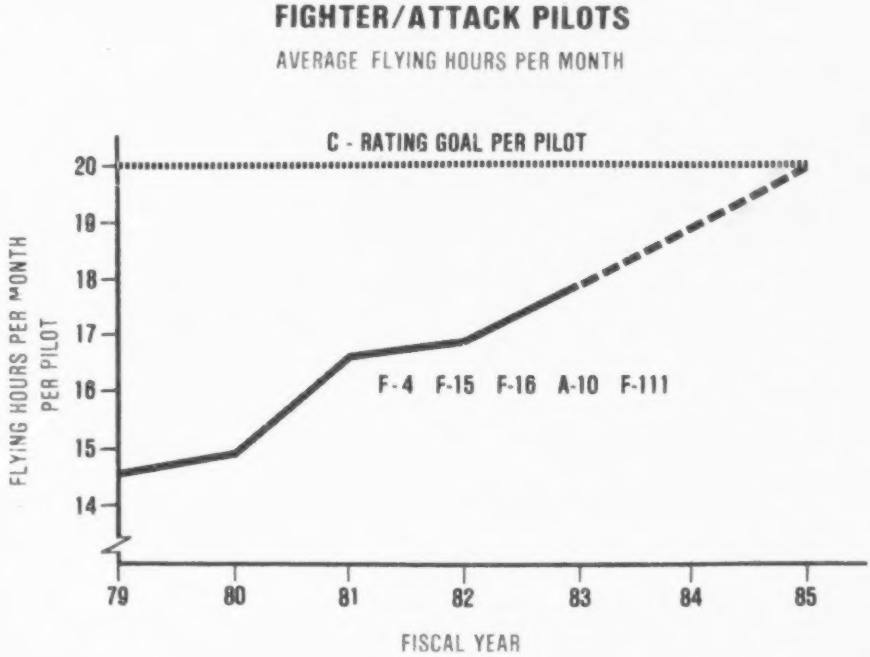
Mr. Chairman, in summary, our Tactical Forces face a serious threat today. While we have held back, the Soviets have modernized and expanded their military capability at such a determined pace that they now threaten to achieve clear overall military superiority.

To counterbalance the massive Soviet military buildup we have taken great care in structuring the Tactical Forces RDT&E and Procurement programs so that they fully support, in conjunction with the other elements of the defense program, our national security objectives. Our programs are the result of detailed and careful deliberations. Our emphasis continues to be on those programs that will improve our operational readiness and sustainability. Both long and short term considerations were carefully weighed, and we made a determined effort to prioritize our needs within fiscal constraints. In addition, we are emphasizing better management while working with our allies and the other services to develop and procure cost effective and supportable weapons systems.

I strongly urge your support for the Tactical RDT&E and Aircraft and Missile Procurement programs as contained in our FY 83 Budget request. If you have questions, I will be happy to answer them at this time.

COST OF INCREASING FLYING HOURS

Senator **Stevens**. Put that chart back on, where you show increasing flying hours.



Slide 10

What does it cost to increase the flying hours 1 hour per month per pilot? What is it costing us to get you to that goal of 20 hours?

General Russ. I really don't know, sir.

[The information follows:]

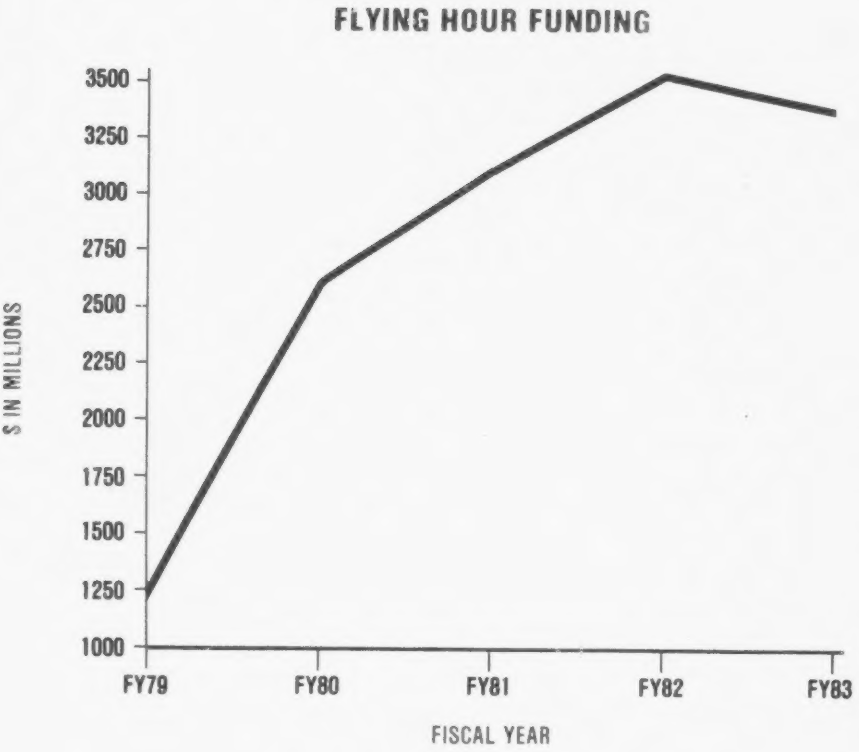
Cost to Goal of 20 Flying Hours

The preceding chart on flying hour funding reflects the total Air Force investment in flying hours for all aircraft and includes operational as well as training sorties.

The cost to increase flying hours varies with each individual aircraft and unit manning but as an example an F-16 unit equipped with 24 aircraft and 31 pilots would require about $1.2 million annually to increase the average flying time per pilot by one hour.

The annual total for the fighter/attack force would be about $425.0 million for a 3 hour per pilot increase and includes fuel, replenishment spares, depot maintenance and base maintenance supply costs.

General **Burke**. Put on the preceding slide and you will get some indication.



FLYING HOUR FUNDING

Slide 9

FUEL COSTS PER HOUR

General Russ. Each airplane naturally costs a different amount of money to fly per hour. For 1982 to 1983 we have a reduction. The reason for that is a reduction in the price of fuel. Fuel has gone down, so we are getting it a little cheaper.

General Burke. It is very substantial.

Senator Stevens. It looks like it is about $½ billion an hour.

General Burke. That is skewed by the fact that the price of fuel was going up pretty sharply in 1979, 1980, and 1981. It is less than that, but is a very substantial amount.

I think no single thing is more important in terms of Air Force readiness though than to have them flying at the correct level. Also, Mr. Chairman, I think in no small measure that increased flying hours account for the excellent progress we have made in retaining our pilots.

One of the big reasons the pilots were leaving in droves was the fact they felt frustrated when they were not receiving enough time to be really competent and professional in their flying assignments.

OPERATIONAL COST OF ADDITIONAL AIRCRAFT

Senator Stevens. You are almost doubling the previous acquisition target for F–15's and you have 600 more of the F–16's. You have a total of nearly 2,000 additional aircraft. I know what it means in terms of procurement cost, but what will it mean in terms of operational cost on an annual basis as we go into this larger fleet of tactical aircraft?

General **Burke**. Most of those aircraft will replace older aircraft which will retire and in many cases those older aircraft are more expensive to operate than the new. There is very little total growth throughout the period we are looking at. We hope by the mid-to late 1980's to flesh out the 40 tactical fighter wings we have, but we will not be in a position to increase the number of tactical fighter wings until the later years at best.

Senator **Stevens**. Two years ago you told us your goal was 729 F-15's. Now we are buying 1,400?

General **Burke**. Yes, sir. That is largely a consequence of pushing off the development of the next generation fighter. When we first came out with our F-15 program back in the 1960's we were anticipating that there would be something beyond the F-16 coming along right about now, and that has been steadily pushed back.

Instead of buying a brandnew airplane, we are proposing to buy more of the existing F-15's and F-16's.

Senator **Stevens**. This is a secure room, isn't it?

General **Burke**. Yes, sir.

Senator **Stevens**. Everyone in here is cleared?

General **Burke**. Yes, sir.

Senator **Stevens**. We are told that [deleted]. Why should we fly our pilots 20 hours a month if [deleted].

General **Burke**. I think the Soviets make a serious mistake on that. I think their pilots are much less well-trained than ours. The Soviets also have, I think, a little more luxury in picking the time that combat might take place than do we, if we are indeed to be ready and prepared to fight now as opposed to 6 months from now.

Senator **Stevens**. Isn't this the readiness fight we got into last year? Which would you rather have, the aircraft on schedule or increased flying hours if you have to cut something?

General **Burke**. We try to strike a balance.

Senator **Stevens**. Balance seems to be increasing both, General.

General **Burke**. We have not really. In the near years we have not added greatly to our fighters, purchasing 180 this year. That is not enough to sustain what we have now.

ATTRITION RATE

Senator **Stevens**. What is your attrition rate right now? How many do you retire each year?

General **Burke**. Counting the ones that are lost and the ones that should be retired, if we were to retire fighters at average age of 20 years it would be about 250 a year to maintain a 40-tactical fighter wing force.

Senator **Stevens**. To maintain 40 wings you need 250? Your goal is 44 wings?

General **Burke**. Yes, sir, but that is some distance off.

Senator **Stevens**. Senator Chiles?

NEW GENERATION FIGHTER

Senator **Chiles**. For the new generation fighter that you are talking about, you are going to start competition for that?

General **Burke**. Yes, sir; it is a little early for formal competition but all of the fighter airframe manufacturers are involved in the studies that are underway. Both Pratt & Whitney and General Electric, who would be candidates for producing the engine, are involved in that.

The engine is in front of the airframe work because that is longer.

Senator **Chiles**. In this one, do we anticipate that we are going to have the Army, Air Force, and Navy both going for a plane, or are we going to try to build one?

General **Burke**. This would not be an airplane suitable for the Army roles and missions.

Senator **Chiles**. I mean Air Force and Navy.

General **Burke**. We think that there are sufficient differences in carrier operations and land-based operations that the Navy will probably want an airplane somewhat different from ours. We think the engines ought to be common and we are jointly involved in development of that new engine with the Navy.

Senator **Chiles**. The engine ought to be common. Are both of those planes going to have one or two of those engines?

General **Burke**. I am going to hazard a guess that it will be two. That is getting a little ahead of the process.

Senator **Chiles**. Thank you.

Senator **Stevens**. The PA has been cut off for security purposes.

Senator **Rudman**. I just have a few brief questions.

AMRAAM VERSUS SPARROW

First, you have put a lot of faith in the AMRAAM and yet there is some real question raised about [deleted] which has to be effective working at the range because of acquisition time.

What is going on in that area? How confident are you that you are going to have [deleted]?

Second, obviously you think it is more cost effective than the Sparrow, yet doesn't the Sparrow with the advanced system work?

General **Burke**. The Sparrow is a good system. We think that the AMRAAM will be a great deal better, have a longer range, multiple engagement capability and have [deleted]. It will be smaller but more lethal because it will come much closer to the target.

That is largely a reflection of the major advances in microelectronics that are taking place and the AMRAAM will develop improvements in rocket engine design as well. Sparrow serves us and our allies well for now.

I do think we have moved into an era that we need to quit upgrading the Sparrow and build the AMRAAM. You are correct, [deleted] are a vital element. We think we understand that quite well, at least in a theoretical sense, but we do need to demonstrate that and we have an extensive program of operational testing that is planned in addition to the computer simulations.

We need to convince ourselves and you that we have a good understanding of that [deleted] and have solved that problem before we permit the production of that missile.

Senator **Rudman**. From what I know about that program, there is little doubt that, with microelectronics at the stage they are now compared to where they were with the Sparrow, the system will fire at the great range it is supposed to fire at to make unnecessary the close-in engagement that was required with the Sparrow. Obviously, that is a desirable thing to achieve.

The other side of the coin is that once that is flown away with its active system, it gives an enemy [deleted].

I wonder if this is sufficiently debated in the Air Force in looking at what the Russians counterthreat is, rather than the 44 wings?

General **Burke**. It has been debated extensively in the Air Force. I was down at Eglin where it is under development. We discussed that with people who are working it. I was impressed with their understanding of that problem and their commitment to come up with a satisfactory solution. It has also been the subject of a great deal of discussion between ourselves and the Office of the Secretary of Defense. They have set out certain criteria that we have to demonstrate to them to answer the question you raised, before we actually produce that missile. Senator Rudman, there is in fact a group working in the Defense Department made up of probably the top experts in the country in the [deleted] area, working in support of the project in Dr. DeLauer's office. It is my understanding they are supposed to look at all the systems and advise the Air Force and Navy what the outyear threat is apt to be in terms of [deleted].

Senator **Rudman**. Are they in fact involved in this at this time?

General **Burke**. Yes, sir. Dr. DeLauer's group is looking at this, and I am sure will give us constructive advice. The reason I am optimistic is that in the final analysis this will boil down to [deleted] duel. The efficiency with which that is done is largely dependent on the microelectronics. That is an area where we are well ahead of the Soviets and expect to stay ahead.

COST OVERRUNS IN LANTIRN PROGRAM

Senator **Rudman**. There has been a fair amount of concern expressed by the authorizing committees in both the House and the Senate on the LANTIRN system. There is, I believe, a mandate for dual evaluation of the LANTIRN and the Navy's FLIR systems. Can you tell us what you are doing in that area?

General **Burke**. Yes, sir. We have had some difficulties with LANTIRN. It is a vital program for the reasons General Russ outlined. We have had a lot of discussions with the authorizing committee on that. General Russ has been a direct participant in that.

Senator **Rudman**. I am concerned, General Russ. If my memory serves me correctly, last year we were talking 200 high, $270 million, $280 million, for that program for 300 systems. We are now looking at $500 million. We have had a very substantial cost growth which indicates something went wrong someplace.

Are my figures accurate? What went wrong and has it been fixed?

General **Russ**. Let me say that what went wrong, or, I should say, what we did that caused the price to go up, is primarily that we took out the concurrency that was in the program. We felt that the risk was too high on the current schedule that we were on, and therefore to have a higher confidence that we would not have major cost overruns when we got into production, we decided to do some more testing and to take some of the concurrency out of that program.

In doing that, it increased the R&D funds. We have a much higher confidence now that we will be able to meet that.

Since we have done that, we have been on schedule and on cost, so I feel much better now, than I did last year on the program.

Senator **Stevens**. If you will let me interrupt for a minute—I am going to have to leave. I hope 1 of you gentlemen will continue this hearing. Senator Andrews will, I believe. I hope you go into this.

JUSTIFICATION FOR INCREASE IN FUNDING FOR F-15 AND F-16

General Burke, the increase in your funding for 1 year in the F-15 alone in terms of the program level is an increase of $25 billion?

General **Burke**. Yes, sir.

Senator **Stevens**. I don't think that we have had a justification for that. Last year, for 1982, you gave us a 729 figure. This year you are over 1,400 in a program. In 1 year the total program objective has almost doubled. I really don't think we have had a justification yet for that magnitude of expansion in this one aircraft.

Similarly, in the F-16; I do hope that you give some further justification on that. I consider that to be the largest increase we face in the Air Force and it has not been really justified.

AIR FORCE AND NAVY POD PROGRAMS

Senator **Rudman**. I want to ask one followup question, General Russ. As I understand it, we are supposed to be now proceeding on a dual track. The Navy is running its own program; you are running yours. I expect at some point someone is supposed to decide which one is better and more cost effective and which will better meet the mission requirement. Is that accurate?

General **Russ**. What we plan to do is to proceed with the LAN-portion of the LANTIRN pod as we currently have it. The TIRN portion of the pod will compete with the Navy variant of the F-18 pod, which will be brought along in parallel with the LANTIRN or the TIRN pod of the Martin-Marietta pods. Those will compete for production. That will occur in the latter part of 1984, the first part of 1985. We plan on flying derivatives of both of those pods and then running them in a head-to-head competition, assuming they both meet the requirements and both of them do the job.

Then we will pick whichever one is the best.

Senator **Rudman**. When you say "we" does that mean the Navy and the Air Force will jointly make that decision? How does that work, bureaucratically?

General **Russ**. The Air Force will decide which one the Air Force wants. The Navy has pretty well zeroed in on the one they have right now.

The problem is that there is a difference between the Navy pod and the Air Force pod, in that the Navy pod will not fit on the Air Force airplane in its present configuration. The Navy has the cooling for the pod in the airplane and we have to have it in the pod. It is not compatible with the same airplane. So, ours has to be different from theirs. So, we are taking their pod, modifying it so that it will work on our airplane, and then compete with the other one. We believe with that competition, we will end up with a better price.

Senator **Rudman**. Thank you.

Senator **Andrews** [presiding]. Senator Rudman raised a point that I want to ask a question on briefly before I turn to Senator Stennis.

R&D REVIEW SYSTEM WITHIN DOD

On this whole subject of RDT&E you said Dr. DeLauer had a group working on it. Is there a group or standing board within DOD where the Air Force is responsible for periodic review and evaluation of these new and recurring R&D projects?

General **Burke**. Yes, sir. Each major R&D project requires a test and evaluation master plan. Before you even begin that process, that plan is subject to a great deal of discussion and debate.

Senator **Andrews**. Do they evaluate each plan separately or do they periodically meet and review all ongoing plans?

General **Burke**. It is a continuing process that takes place in OSD and Dr. DeLauer's group. They approve our plan. Then when we begin the development process and actually do the test and evaluation, that is all monitored by a special Air Force organization called the Air Force Test and Evaluation Center, that reports directly to the Chief of Staff.

In effect, it serves as the conscience of the Air Force to make sure that we have done what we have set out to do before we build a system. That, in turn, is all reviewed by the Office of the Secretary of Defense.

Senator **Andrews**. As an example of the review system, when was the last review and what did it encompass, or what was the result?

General **Burke**. Of the AMRAAM?

Senator **Andrews**. No, of the last review. You have this review board. You are setting it up to review your research and development projects. You say it meets periodically and reviews each project. When did they last hold a meeting? What was the subject and what was decided?

General **Burke**. It is not a board; it is an organization that does this each and every day. That is the nature of their business.

Senator **Andrews**. You don't have a standing board or committee within the Air Force to review these projects on an ongoing basis?

General **Burke**. We have no board; we have organizations that do that. It starts with the Research and Development Command, the Air Force Systems Command, along with the operating command, to put together the test and evaluation program that is to be followed for each development and that is reviewed and approved as it works its way up through the Air Force; but it is done within our normal organizational structure, as opposed to a board.

Senator ANDREWS. So it is just an ongoing thing rather than being a board that has an overall review capability?

General BURKE. Yes, sir. Then that is supplemented further.

THE SECRETARIAL PROGRAM REVIEW (SPR)

We have quite an elaborate system we call SPR—secretarial program review. On all our major programs, the Secretary of the Air Force personally reviews the progress and that is normally done each 6 months for each program, and that is done on a schedule.

Senator ANDREWS. Who makes up that secretarial board?

General BURKE. It is the Secretary, himself, and his Assistant Secretaries, Assistant Secretary for Research and Development, and the Assistant Secretary for Financial Management.

Senator ANDREWS. What, for instance, did they study in the last review—all of your ongoing projects?

General BURKE. No, sir. Typically, they will look at three at a time.

Senator ANDREWS. Every 6 months, they look at three?

General BURKE. No; they see every one every 6 months. They are meeting a lot more than every 6 months.

Senator ANDREWS. They meet and they review more often than every 6 months?

General BURKE. Yes.

Senator ANDREWS. In this schedule of meetings, what can we assume, that they are on a biweekly basis, or monthly basis?

General BURKE. Biweekly is about right.

Senator ANDREWS. What did they review the last time they met?

General MARSHALL. Their last review was LANTIRN, MAVERICK and AMRAAM, I believe. That was last week.

Senator ANDREWS. Did they come up with some of the information that my colleague from New Hampshire asked for?

General MARSHALL. Those reviews were status reviews of those programs. They are mainly management oriented; they deal primarily with how well the program is being managed: Is it on schedule? Is it within cost? Are there any serious technical problems?

Senator ANDREWS. I would assume there would be an overall management group looking at the whole gamut. For instance, you are replacing the old F-106's with the F-16's shown in your slide presentation. What effect does this have on the $15 million we appropriated last year for F-106 modification? Do they look at something like that?

EXPLANATION OF AIR FORCE REVIEW SYSTEM

General BURKE. Yes, sir. Anything that requires Air Force investment that goes into our budget comes up through what we call the Air Force board process. It is done as part of our POM process, which is program objective memorandum, which is the beginning of the budget.

We are well underway, halfway through the 1984 budget, as a matter of fact, right now, in the building. At the lowest level we have a cross air staff panel to deal with each mission, an aircraft panel, for instance, made up of lieutenant colonels, colonels, and all the functional agencies. That is the first-level review. It moves from there to a group that is called the program review committee, where for the first time all of these things are brought together for the total program. Then it goes to the Air Staff board which is made up of a group of major generals. General Russ happens to be our representative on it. It is reviewed at that level. Then it goes to the Air Force council which is made up of the lieutenant generals, myself included. Then we present it to the Chief, the Secretary, and his staff.

Senator ANDREWS. Who looks at the $15 million you are spending to upgrade a plane you are going to take out of inventory?

General BURKE. We are not going to take it out tomorrow.

Senator ANDREWS. When you do this upgrading, I understand it takes several years for this kind of modification program to get engineered and in place and all of that, or is this something you do overnight?

EXTENT OF BUDGETING FOR MODIFICATIONS

General BURKE. When we made the decision to replace the F-106's, we took substantial moneys out of our budget, very large sums, that were in there for major retrofits of the F-106. What is left is the minimum necessary just to keep them safely flying until the last ones are retired in 1988.

Senator ANDREWS. Did you take the money out of the 1982 budget or did you take it out of your contemplated request for 1983 and 1984 budgets?

General BURKE. There would have been a much larger request in the 1983 budget for F-106 updates had we not gone forward with this proposal.

Senator ANDREWS. The money in the 1982 budget for retrofitting the F-106's will be used?

General BURKE. Yes.

Senator ANDREWS. When will these modifications finally be put on these airplanes?

General BURKE. Work that is done in 1983 will start showing up in 1984. Money spent in 1982 will buy modifications delivered in 1983.

Senator ANDREWS. In other words, the modifications in the fiscal 1982 budget will all be completed in 1983?

General BURKE. I wouldn't state that absolutely, but I will check and provide it for the record.

Senator ANDREWS. Supply for the record when those modifications will be put on.

Modifications for fiscal year 1982 budget installation schedule

Fiscal year 1982 modification:	*Fiscal year*
Upgrade X band transistor assembly	1982-84
Improve fault detection tester	1984
Provide fuel tank straps	1983
Replace obsolete turn rate transmitter/pitch G limiter	1982-84

RETIREMENT OF F-106'S

General BURKE. The last F-106's will not be retired until 1988.

Senator **Andrews**. That is true, but I thought those modifications go down quite a few years?

General **Russ**. What we attempted to do when we initiated the decision to go with the F-15 was to go back to the F-106 and take everything out of there that was not absolutely necessary to get that airplane safely to the 1988 time frame. There were some things that were ongoing; it was cheaper to keep them ongoing than to terminate because of the termination clause penalties.

We reviewed each and every item in the F-106 in that regard. There may be some of the things in 1982 that we have since decided not to do, I am not sure, but we can certainly provide you which ones we looked at.

[The information follows:]

F-106 Modifications

The fiscal year 1982 F-106 modification program includes the following modifications which are required to support the aircraft that remain in the inventory:

Mod title:	*Fiscal year 1982 cost (millions)*
Upgrade X-band transistor assembly	$14.0
Improve the fault detection tester	.6
Provide fuel tank straps	.1
Replace obsolete turn rate transmitter/pitch G limiter	.6
Total	15.3

UPGRADING OF AIR GUARD SQUADRONS

Senator **Andrews**. Senator Stennis?

Senator **Stennis**. Thank you, Mr. Chairman. I am sorry that I was late. I was at another meeting. I have no special questions.

Thank you very much.

Senator **Andrews**. Under this whole idea of the amount of money you are spending on flying hours versus aircraft purchases that the chairman raised a few minutes ago, you got into the 40 wings versus the 44 wings that you are going to have downstream.

You showed a very narrow slice of the pie that you are going to put an F-15 squadron in an Air Guard unit. When we are talking about dollar savings, you are talking about the need for more money for flying hours to keep the pilots up and to keep them interested in staying in the service, and when you are also pointing out how badly we need the aircraft, why are we trying to add 10 percent to our weight instead of moving some of this better equipment to the Air Guard squadrons? Are you trying to pull away from the Air Guard concept?

Would we not be better off to get them up to a modern performance level than to try to add more wings when you don't have some of the ones that you are presently maintaining up to snuff?

General **Burke**. Yes, sir, clearly our first priority should be to flesh out and properly equip the existing 40 tactical fighter wings, which includes 14 that are in the Air Reserve Forces, both National Guard and Reserve.

I think we ought to do that before we even think about adding another tactical fighter wing.

Senator **Andrews**. I am glad you think we ought to do it. The only thing is that every program I have seen doesn't contemplate that. The programs that I have seen contemplate adding four more wings, and sometime, 5 or 6 years out, you are going to start putting a handful of F-15's in the Air Guard units which are more ready to go really than some of your active units.

General **Burke**. We are not proposing to put F-15's in the Guard; we are proposing to put F-16's in the Guard for air defense. My recollection is that between now and about the late eighties we will have eight squadrons of F-16's and nine squadrons of A-10's in the Reserve Forces, some of which will be new equipment from the factory to those units.

Senator **Andrews**. You say you are going to put A-10's in there. There is a considerable difference of opinion on whether we should purchase any new A-10's?

General **Burke**. In days gone by, it is true that the Air Reserve Forces got hand-me-down airplanes. I am just pointing out that we will have at least 17 squadrons, some of which will have airplanes right out of the factory door, and some transferred from the Active Force.

Senator **Andrews**. Sometimes there is nothing wrong with giving them hand-me-down airplanes; they fix them up so that they are in better shape than they were several years earlier in the Active Force.

General **Burke**. I am a great admirer of the Reserve Forces. I am totally committed to the total force concept. I think we get marvelous results from them.

ECONOMIC BURDEN PLACED ON NATION FOR MILITARY BUILDUP

Senator **Andrews**. National attention is now focused on the rising budget deficit. A squabble is going on in the House right now and the fuss we had 1 week ago, trying to get a budget resolution through here, certainly points to that. All of us are under pressure, those of you in the adminstration as well as those of us in the Congress, to cut the growth of Federal outlays. The vast increase in aircraft procurement that you put in the 1983 budget seems to go in the opposite direction. As we see it, outlays for the F-15 aircraft will rise from $245 million in 1983 steadily to $3,300 million by 1987. The F-16 outlays will leap from $276 million in 1983 to $3.4 billion by 1987. These are just two examples. There are more. The totals are staggering. Outlay numbers in the same time frame for the B-1 and the M-X are even worse.

I think we short circuited the M-X. The question is whether the Nation can afford this kind of buildup.

The day before yesterday when we had the two engine manufacturers here, they showed what you are doing in the E models of the F-16. You are building a heavier, chunkier bird that will need that much more thrust to get around. The people in the Air Force told us they like the one they have. Why clutter it up with every piece of paraphernalia that you can stick on it that adds to cost?

As we understand it, the Russians in their new frontline airplanes that you expressed your concern about on those charts, the numbers and the newer concept of them, not concept but the lower average age of those planes, is essentially a simple, well-designed, good flying and fighting machine.

Here we find our side going to bigger, heavier, more complex planes with more things to break down, at much higher cost.

Has the Air Force attempted to make any serious economic assessment of the Nation's ability to shoulder this burden as you increase the per copy cost, not just because of inflation but also because you add every piece of paraphernalia you can find to the plane?

General BURKE. There are several elements to your question.

Senator ANDREWS. There are a lot of elements.

General BURKE. Let me try to go back to the very beginning: Can the country afford what it needs for its defense? I will defer to you on that. There is no doubt in my mind that the need is there.

Senator ANDREWS. Obviously we have to spend what we need for defense. The question is, Do we need to Tinkertoy the thing up to the point where we can't afford it? Part of this question belongs to the chairman and part of it is a pure Andrews question; in essence, it is a thing we have to take a look at.

AIR FORCE PROPOSAL FOR AIRCRAFT PROCUREMENT AND MODERNIZATION

General BURKE. I would like to outline our proposal. What we are putting to you is a proposal. We are not in a position to make a decision. We have to go through the various steps of it. Perhaps you can tell me what parts you agree or disagree with. We would like to flesh out as a minimum the existing 40 wings which we have been authorized. We would like to have the airplanes to fill up those wings. There will not be a new airplane available until the mid nineties, the Advanced Tactical Fighter.

In order to maintain a 40-wing structure we need to buy 270 fighters a year. That is a sufficient number that we would like to have competition for. We would like to buy not all F-15's or F-16's. We would like a balanced buy between those two until we get a new fighter.

We have agreed amongst ourselves, and in give and take with the Congress, to push back that new fighter quite distantly because the major changes that have come along in our business in the past few years have not been in airframe or aircraft engine improvements, and a lot of that is substantial, but in electronics.

There is a dramatic improvement in electronics. So, the trend—and I think it is a correct one—is to keep airplane designs longer and update the electronics portions of it to go with the older engine and the old airframe. That basically is what we are doing. We are proposing to buy about 250 fighters a year.

We are proposing to modernize them mostly in the electronics sense and not tactical development of the new airplane. We will not have one until around the mid nineties.

Senator ANDREWS. How much more does the F-16E cost than the prior model, 10 percent?

General BURKE. Fifteen percent, I think, would be a fair guess. It would do an altogether different job. It would do a job that badly needs doing. I don't know of any cheaper alternative that will make us do that long-range strike interdiction mission than an F-16E.

SUBMITTED QUESTIONS

Senator **Andrews**. Thank you very much, Generals. The committee has additional questions which we will submit to you for response.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

ADDITIONAL COMMITTEE QUESTIONS

OVERCOME EXTREME CLASSIFICATION

QUESTION: The justification for an extraordinary increase in tactical aircraft will have to be defended in a public forum. And yet much of the information relating to the Soviet threat is heavily classified. Has anyone in the Pentagon attempted to determine how to overcome that obstacle?

ANSWER: The classification assigned to each, if not all of the very sensitive data pertaining to the Soviet threat, is determined by the Director of Central Intelligence who has the overall responsibility in the US intelligence community of protecting our sources and methods. A number of recent reviews both within DoD and in a wider inter-agency context have been undertaken both in this and prior administrations to seek ways to declassify persuasive intelligence data. There has been considerable progress made as witnessed by the extensive declassification attendent to the DoD publication of Soviet Military Power in 1981 and a NATO Study distributed in April this year. While there appear to be temporary advantages to such a process, there is wide inter-agency agreement at the highest levels that the definite long term disadvantages of more extensive disclosures on balance are far more significant. As sensitive specific data is declassified, the US potential to collect similar data in the future is commensurately eroded as source and methods become apparent to adversaries. Further information on this matter should be sought from the Director of Central Intelligence.

INCREASE FOR F-15'S

QUESTION: How did you reach your increased aircraft production goals? For years, 729 F-15s were considered sufficient. Now suddenly, we need 1,400 of them. Please tell us what was involved in working up these increases for the F-15 and other aircraft.

ANSWER: The FY 82 Amended Budget request noted the requirement for additional F-15s to support air defense modernization and to increase our tactical capability. At that time the additional number was not firm and our budget documentation listed the total F-15 buy as TBD (to be determined). The increase from 729 to 1395 F-15s stretches over an 8 year period (1982-1990) and is required to modernize and grow our force to provide a viable deterrent against a threat that is becoming increasingly capable. Therefore, we must continue to buy fighters to achieve our fighter forces goals as well as replace those aircraft lost through normal attrition. Furthermore, when F-15 procurement goals were first set we envisioned an Advanced Tactical Fighter being available in the mid 80s. However, delayed ATF acquisition necessitated revision of Force Structure requirements and continued F-15 procurement.

ADDITIONAL JUSTIFICATION FOR BUILD-UP

QUESTION: What additional guidance can you give the committee in justification of this tremendous build up? We cannot possibly match the Soviet and Warsaw Pact forces plane for plane. So how do we determine and justify the proper number of combat aircraft?

ANSWER: I would not characterize the growth of our Fighter/Attack Force to 40 TFWs as a "tremendous buildup" but rather a continuing attempt to attain our 1974 goal of 40 TFWs by 1980. We are currently short 4 TFW equivalents and fiscal constraints have required us to further delay the 40 TFW force until 1985. Even then we must reluctantly allow the force to age from the current 8 year average to about 10.5 years to achieve the 40 TFW force.

Theater commanders are primarily responsible for assessing the threat within their respective operating areas and determining the appropriate forces (planning forces) needed to deter/defeat a given threat. Unfortunately, our programmed forces fall far short of providing the reasonable assurance of success associated with the planning forces. In summary, we do not intend to match the Soviet capability in numerical terms, but rather we will strive to field superior aircraft flown by more highly trained crews.

DEPLOYMENT OF ADDITIONAL FIGHTER-WING

QUESTION: With the Navy, we understand certain numbers of aircraft are associated with concept of a 15-carrier battle group. There is no similar yardstick with the Air Force. How and where will these additional fighter wings be deployed, and how will this deployment meet the Soviet threat?

ANSWER: In 1974 the Air Force set a goal of 40 TFW's by 1980. Fiscal constraints have since forced the delay of this until 1985. 40 TFW wings represent 2880 aircraft (72 combat coded aircraft per wing) and is equivalent to the Navy's concept of a 15 carrier battle group. This 40 TFW "yardstick" is considerably less than the unified and specified commanders have determined is necessary to fulfill their mission requirements and represents a balance between fiscal resources and tactical needs. Some of the additional aircraft will probably be forward deployed with the remainder available in the Conus for rapid response worldwide. However, it is impossible to specifically predict how and where such deployments will occur because they are basically scenario dependent.

PRIORITIES FOR REDUCED WEAPONS PROCUREMENT

QUESTION: Congress may be faced with difficult choices within the overall defense function. If weapons procurement has to be reduced, where do the priorities lie? In this instance, do tactical aircraft come before strategic weapons such as the B-1 and MX?

ANSWER: Our overall priorities in developing the Air Force budget placed the needs of our people above all other aspects of the program. Within our force planning we gave highest priority to strategic force modernization, followed by readiness and sustainability, and finally, to tactical force modernization and growth.

As we allocated our resources to meet these priorities, we attempted to maintain a measure of balance to ensure capabilities across the spectrum of conflict. We recognize the overriding requirement for strategic force improvements, but we cannot ignore the global threat and very significant enhancements in Soviet conventional forces over the recent years.

Against this background, procurement reductions raise a different set of questions. We must maintain our strategic modernization programs as the cornerstone of our national security posture. In this regard, B-1 and MX are critical programs.

At the same time, we cannot neglect tactical aircraft modernization and force expansion programs because of the evolving Soviet threat. Without adequate conventional forces, we would be forced to increasingly rely on nuclear escalation to deter and defeat Soviet aggression. Tactical force modernization and expansion can ensure air superiority over the battlefield to permit our ground forces to operate effectively while also ensuring our capability to disrupt enemy operations through air interdiction.

In addition, the Air Force is being directed to aid US and Allied naval forces in protecting the sea lines of communication -- a task in which strategic and tactical aircraft can play a significant role. Land-based aircraft can make a major contribution in key conflict areas of the world, but the task will stretch our limited forces.

For the above reasons, we would be reluctant to cut tactical force procurement. Our strategic programs are also critical and should remain a high priority; therefore, reductions, if necessary, must be balanced with regard to current capabilities and national security requirements.

RECOMMENDATION TO DEACTIVATE A FIGHTER/INTERCEPTOR WING

QUESTION: The Senate Armed Services Committee rejected a recommendation to deactivate a fighter/interceptor wing to yield a savings of $80 million, How would this action be taken if the recommendation was accepted? How many aircraft?

ANSWER: To yield an FY 83 savings of approximately $80M, the Air Force would reduce aircraft from the fighter force program at various locations in the United States. The total number of aircraft authorizations reduced from all locations would be 66.

FIGHTER WING

QUESTION: Would a forward deployed fighter wing be deactivated?

ANSWER: No.

ADDITIONAL INFORMATION ON FIGHTER WING DEACTIVATION

QUESTION. Please supply more detailed information on the fighter wing deactivation that was proposed in the budget give-ups.

ANSWER. The Air Force submitted a budget reduction proposal that involved a reduction in combat fighter forces of approximately one tactical fighter wing. An actual fighter wing deactivation was not proposed. The budget reduction of $80M was achieved by reducing the fighter force program by a total of 66 authorizations from various locations in the United States.

120 F-16 BUY

QUESTION: The Administration is requesting $1.7 billion to buy 120 F-16 fighters in FY 1983. In March we were told by General Allen that the Air Force originally asked for 180. Is a procurement rate of 180 considered the most economical? What is the cost savings?

ANSWER: A production rate of 180 per year would be the most economical. Although we could expect a savings of approximately 10-12% in the unit cost, a significant increase in Total Obligation Authority would be required to procure the additional aircraft.

FY 83 INCREASE FOR F-16 ADVANCE PROCUREMENT

QUESTION: The Senate Authorization Bill for FY 1983 increased F-16 advance procurement by $167.3 million. Do you consider this increase realistic? Would you support the increase if we had to make a corresponding reduction in other Air Force procurement programs?

ANSWER: The $167.3 million in advanced procurement in the Senate Authorization Bill to protect the procurement of sixty additional F-16s in FY 84 is realistic. The Air Force supports the President's Budget request for 120 aircraft in FY 83 as part of a four year (FY 82-85) multiyear procurement of 480 aircraft (120 aircraft per year). We do not support the increase at the expense of other Air Force programs.

AIR NATIONAL GUARD AND AIR FORCE RESERVE MODERNIZATION

QUESTION: The higher rate of F-16 production would help the Air National Guard and Air Force Reserve accelerate their modernization. Will the Guard be receiving the older F-16As and Bs, rather than the new F-16Cs and Ds?

ANSWER: During the FY 83-87 Five Year Defense Plan, the tactical Air Reserve Forces (ARF) are programmed to receive F-16A/Bs. ARF units converting after F-16C/D availability will be Air Defense units. These units are scheduled to receive F-16A/Bs modified with AMRAAM. F-16C/Ds are not programmed for these ARF units since they will have air-to-surface enhancements (e.g., LANTIRN, PLSS, GPS) which are not required for the Air Defense mission.

REDUCTION IN F-16 PROCUREMENT

QUESTION: The Air Force is proposing that its active tactical fighter wings grow from 24 in FY 1982 to 29 by end of the decade. An expansion of reserve wings is also proposed. If we have to cut back on Air Force structure growth in order to achieve budget savings, won't this require a reduction in F-16 procurement for the life of the program?

ANSWER: No. If required to reduce Force Structure to achieve budget savings, we would phase out older less capable aircraft which would allow savings in operating costs for these units. However, in order to continue modernizing our force, we still must actively pursue our fighter procurement program.

POSSIBILITY OF FORCE REDUCTIONS

QUESTION: To what extent has the Air Force planned on the possibility of force reductions in its procurement strategies?

ANSWER: The Air Force has not planned on the possibility of force reductions in its procurement strategies. Presently, near-term procurement will not meet DoD requirements. When faced with the conspicuous Soviet military build up and the need to modernize the tactical fighter force, a reduction in aircraft procurement would not be a feasible alternative and should not be considered now or in the near future.

F-16 ATTRITION AND MAJOR CAUSE OF THESE LOSSES

QUESTION: A civilian design consultant has charged that recent F-16 crashes are the cause of a serious design flaw. The aircraft's flaw was its all-electric control system, according to the critics. What has been the extent of F-16 attrition, and what is considered the major cause of these losses?

ANSWER: As of 6 Jun 82, there have been 18 USAF F-16s destroyed while flying 133,773 hours. This represents a destroyed rate of 13.5 per 100,000 flying hours. Both operator and logistic factors have been involved in these losses and each mishap has been investigated in detail. USAF F-16 experiences represent the normal range of problems associated with maturing and fine tuning a new aircraft.

IS ATTRITION RATE EXCESSIVE

QUESTION: We understand the attrition rate is 11.8 planes per 100,000 flying hours. Is that considered excessive?

ANSWER: The current 13.5 F-16 destroyed rate for 133,733 hours compares very favorably with previous generation single-engine fighter aircraft. Mature system destroyed rates for the F-15, F-86, F-100 and F-105 were 66, 26.2, 16.1 and 15.6 respectively. The F-16 at the 100,000-hour point in its development had the lowest destroyed rate of any single-engine fighter developed by the USAF.

CORRECT DESIGN FLAW IN F-16

QUESTION: What has the Air Force done to correct what might be considered a serious design flaw in the F-16?

ANSWER: The Air Force does not believe there is a serious design flaw in the F-16. Of the nineteen F-16 accidents in which the aircraft were destroyed, only the interruption of power to the flight control computer has been identified as the cause of more than a single accident.

Immediate action was taken in the September 1981 time frame to improve the reliability of the power supply to the flight control computer, and actions to further improve electrical system reliability are currently under way.

MULTIYEAR PROCUREMENT DECISION UNDER THE CIRCUMSTANCES

QUESTION: Is it wise to make a multiyear procurement decision under the circumstances?

ANSWER: Since there is no serious design flaw which would require major redesign, there is no reason not to pursue the multiyear procurement of the F-16. Minor changes will continue to be introduced in the normal engineering change process with no impact on multiyear.

REDESIGNED WING FOR F-16E

QUESTION: We understand the redesigned wing for the F-16E, which is to be rolled out in July, will provide sharply increased lift. What is the situation exactly?

ANSWER: The new "cranked arrow" wing on the F-16E(XL) is a significant advance in aerodynamic design. The new design, which includes greater wing sweep angle and leading edge flaps, produces more lift during maneuvering flight. In addition, the new wing has much greater surface area which generates more lift during cruise conditions. Engineering studies and wind tunnel tests indicate it will have markedly greater lift capabilities in the supersonic flight regime.

The "cranked arrow" wing will retain the current subsonic aerodynamic efficiency of the F-16A wing while carrying 82% more internal fuel, and will offer better transonic-supersonic aerodynamics. The F-16E(XL) also will have a computerized flight control system which will be tuned to maximize the benefits of the new aerodynamic design.

INCREASED ABILITY OF F-16

QUESTION: What are the implications of this increased lift? This would seem to suggest an increased ability of the F-16 to carry more without necessarily increasing engine thrust. Is that a reasonable assumption?

ANSWER: In addition to the advantage of increased lift, the "cranked arrow" wing has 121% more surface area than the current F-16A wing. This allows semi-conformal carriage of weapons which will significantly reduce drag associated with carriage of weapons and pylons under the wing. The wing also holds 82% more internal fuel. The combination of increased lift, reduced drag, and more internal fuel greatly increases the combat radius and payload of the F-16E when compared to the F-16A with the thrust level of the F100 engine.

ADDITIONAL THRUST VITAL

QUESTION: Wouldn't additional thrust still be vital to a multi-mission aircraft like the F-16E?

ANSWER: The General Dynamics analysis supported by the initial Air Force analysis shows that the F-16E performance is acceptable with today's thrust levels. We will verify that analysis in future flight tests of the F-16E by flying with the F100 as well as the F101 Derivative Fighter Engine (DFE).

FUNDING RELATED TO MULTINATIONAL STAGE IMPROVEMENT PROGRAM

QUESTION: The Air Force is requesting $65.1 million in FY 1983 R&D for continued F-16 radar improvements, hardware flight testing and AMRAAM integration. How much of this funding is related to the Multinational Improvement Program? How much to initiate operational testing of the MSIP Stage II F-16 improved radar?

ANSWER: Of the $65.1 million in the FY 1983 RDT&E request for the basic F-16 (excludes flight evaluation of the F-16XL), $38.2 million is associated with MSIP. Of the $38.2 million, $1.5 million is to initiate operational testing of the MSIP Stage II configuration.

NUMBER OF F-16's IN MSIP II

QUESTION: How many of the 120 F-16s requested in FY 1983 are scheduled to be in the MSIP II configuration?

ANSWER: Of the 120 F-16s requested in the FY 1983 President's Budget, 60 will be in the MSIP II configuration.

TOTAL COST OF MSIP DEVELOPMENT

QUESTION: What is the total cost of the MSIP development through Stage III?

ANSWER: The total cost of the F-16 MSIP development effort is $176.3 million, including $50.0 million of FY 82 and prior funds. These costs do not include the development cost of MSIP Stage III growth systems (AMRAAM, ASPJ, SEEK TALK, etc) which are funded under their respective program element.

F-16 ENHANCEMENT PROGRAMS

QUESTION: F-16 enhancement programs are wide-ranging and involve total costs in the billions of dollars. How essential are they all? Can't they be trimmed?

ANSWER: As a result of both quantitative and qualitative increases in the threat, the TAF has established F-16 requirements for night/weather capability, secure voice communication, precision navigation/strike capability, internal ECM, improved radar warning and a beyond visual range (BVR)/all weather missile. The F-16 Multinational Staged Improvement Program (MSIP) is the management architecture to achieve required improvements economically, effectively, and efficiently; and represents an orderly, phased upgrade program for the F-16 weapon system.

The improved systems are essential if the F-16 force is to survive and be effective against the Soviet threat beyond the mid-1980s. Since the NATO air assets are outnumbered approximately four to one, the capability to achieve first radar detection and beyond visual range kills is a must. Likewise, the enemy's capacity for around-the-clock ground operations in all-weather conditions demands that the US Fighter Force be able to counter whenever and wherever the threat chooses to operate. The USAF cannot afford to ignore the expanding threat, and fail to provide essential capabilities.

OVERLOADING THE F-16

QUESTION: What about widespread criticism that the Air Force will ruin the swift and maneuverable advantage of the basic F-16 by overloading it with complex electronics and unrealistic mission requirements?

ANSWER: The Air Force Multinational Staged Improvement Program (MSIP) for the F-16 will provide essential capability upgrades so that the F-16 can survive and be effective against the threat of the mid 1980's. For example: (1) The F-16 must have the avionics and weapons to ensure first radar detection and beyond visual range kills in the Central European environment where we are significantly outnumbered. (2) Some F-16s must also be missionized to operate at night and in degraded weather conditions to deny enemy operations in such a sanctuary. (3) Updated, internal ECM capacity will not only enhance survivability but allow a substantial drag reduction since external ECM pods will not have to be carried. These requirements are real and can be implemented while retaining the F-16's excellent maneuverability.

THREE STAGES OF MSIP PROGRAM

QUESTION: MSIP alone includes a wide range of capability enhancements. Please review the three stages of the MSIP program and comment on criticism by the House Armed Services Committee that its cost is not under control?

ANSWER: MSIP stage I provides essential structure, wiring and interface provisions to support future aircraft avionics improvements, as well as, a number of the proposed growth systems. Production incorporation was effective in November 1981.

MSIP Stage II provides aircraft avionics and subsystems improvements necessary to support future growth, and incorporates necessary changes to maintain single pilot operability in high task/threat situations through up front controls and displays. Production effectivity is scheduled for December 1984.

MSIP Stage III provides for installation and retrofit of specific growth systems (ASPJ, SEEK TALK, ALR-74, AMRAAM, PLSS, etc.) to meet future mission needs. Production incorporation of each growth system will be directly linked to the production decision for each respective system.

The HASC attributed all of the increase in the FY 1983 RDT&E request to MSIP cost growth. Of the $23.1 million increase, only $11.2 million is attributed to MSIP. A reestimate increased the development of the improved radar by $9.7 million and $1.5 million was added for AFTEC operational test and evaluation which was not included in the provisions scope.

The remaining portion of the FY 1983 increase ($11.9 million) included the development of an emergency backup pump system (EBPS) to enhance fuel pump reliability ($10 million), and an increase in flight test and support cost ($1.9 million).

1981-1983 FUNDING DETAILS FOR MSIP

QUESTION: Please supply 1981-1983 funding details for MSIP. Also give us long range cost estimates.

ANSWER: The MSIP costs in FY 81-83, as included in the FY 83 President's Budget, amount to $891.8M. These funds are broken out as follows:

	($ in Millions)		
	FY 81	FY 82	FY 83
Improved Radar and AMRAAM Integration (RDT&E)	19.0	22.0	38.2
MSIP II (Production)	55.5	221.3	535.8
Total	74.5	243.3	574.0

These costs include F-16 funded items only. Development costs for for MSIP III growth systems (AMRAAM provisions, ASPJ, SEEK TALK, PLSS/GPS, ALR-74, and LANTIRN provisions) are funded under their respective program elements.

The total acquisition cost of MSIP through FY 90 (including FY 81-83) is approximately $7 billion. This cost is based on 662 MISP II/III F-16 C/D aircraft plus the 538 additional aircraft included in the OSD approved program and priced using a weighted factor for configuration (F-16 C/D or F-16 E). Since MSIP II is the baseline for the FY 82 through FY 85 multiyear procurement, the cost of MSIP II is not separately priced in negotiations. Cost projections for MSIP II can therefore only be approximated.

UP-TO-DATE BREAKDOWN OF F-16 PROCUREMENT COMMITMENTS

QUESTION: The U.S. plans to procure 1,986 F-16 fighters. Can you provide for us an up-to-date breakdown of F-16 procurement commitments made by our NATO allies, Israel and Egypt, and other prospective customers?

ANSWER: The following commitments (on contract or signed LOAs) have been made for purchases of F-16 aircraft:

Country	Number of Aircraft
Belgium	116
The Netherlands	144
Norway	72
Denmark	58
Israel	75
Egypt	80
Korea	36
Pakistan	40
Venezuela	24
Total	645

The Netherlands originally committed to purchase 102 aircraft as part of the 348 aircraft European coproduction program. The Netherlands has committed to buy an additional 42 aircraft out of a planned follow-on buy of 111 aircraft. Israel is eventually expected to buy an additional 75 aircraft to supplement its original procurement.

FOREIGN SALES FOR F-16

QUESTION: How have foreign sales altered unit costs of the F-16?

ANSWER: Recent FMS sales have reduced the USAF costs of the F-16. As stated in the 31 Dec 80 SAR, a TY$ savings of $75.7M was realized by the sale to Egypt. This reduction is reflected in the current budget request. Subsequent sales to Korea, Pakistan, Venezuela and The Netherlands will provide additional savings to the USAF F-16 procurement. Savings from these sales will be included in future budget submissions.

INCREASED F-16 PRODUCTION DECREASE UNIT COST

QUESTION: Would the increase in F-16 production now being proposed for the active and reserve wings serve to decrease F-16 costs?

ANSWER: The addition of 20 F-16 aircraft in the FY 83 budget, as proposed by the HASC, would have an inconsequential effect on the average unit cost of the 480 aircraft to be included in the multiyear contract. The addition of the 60 F-16 aircraft proposed by the SASC in FY 84, and assumed to continue in FY 85, would decrease the average unit cost of the aircraft on the multiyear contract by approximately 10-12% in the FY 84 and FY 85 buys.

COST INCREASE FOR LANTIRN

QUESTION: LANTIRN is the program which will give the F-16 an optimal night attack/adverse weather capability. The Air Force has stated that an urgent requirement exists for this program. LANTIRN program acquisition cost went up from $1 billion to $1.8 billion in about one year. What were the reasons for the cost growth?

ANSWER: The LANTIRN program was initiated with a highly compressed schedule and concurrent production efforts because of the high priority requirement for the LANTIRN capability. Our subsequent review of the long term supportability and near term test milestones determined program changes were necessary to reduce risk and establish a high confidence program.

Program changes which reduced risk but increased total estimated development cost included addition of breadboard fabrication of each major subsystem, increase of integration testing, and extension of flight test evaluation. Estimated production costs increased with inflation as a consequence of a slip in the start of production.

UNIT PROCUREMENT COST OF LANTIRN

QUESTION: What is the estimated unit procurement cost of a LANTIRN navigation and targeting pod?

ANSWER: The estimated unit procurement cost for a LANTIRN pod set is $4.5 million in Then Year dollars based on a total quantity buy of 300 and the corresponding unit flyaway cost is $2.6 million. The targeting pod represents approximately 60 percent of this unit cost estimate while the navigation pod is approximately 40 percent.

COST EFFECTIVENESS OF LANTIRN

QUESTION: The GAO has questioned the cost effectiveness of LANTIRN. What is your response?

ANSWER: A study by Air Force Studies and Analyses office was recently updated to consider the latest LANTIRN costs and additional configuration variation. This study, which has been reviewed and approved for publication, concludes that LANTIRN remains cost effective for both the F-16 and A-10 aircraft. In particular, the study shows that LANTIRN is still the most cost-effective single alternative for use across all mission areas.

COMPETITIVE PROCUREMENT BETWEEN LANTIRN AND F-18 FLIR POD

QUESTION: The Armed Services Committees are attempting to re-open the LANTIRN issue by initiating a competitive procurement between LANTIRN and the F-18 FLIR pod. What is the Air Force position on the issue?

ANSWER: In a letter to the Armed Services Committees dated 30 Mar 1982, the Secretary of the Air Force stated the Air Force believes reopening the development competition per se would be inappropriate without going back to wholesale recompetition. However, it is appropriate to conduct a procurement competition for the LANTIRN targeting pod production contract between vendors with available hardware that meets our F-16 tactical air night attack requirements.

The letter further stated that the Air Force is taking steps now to arrange such a procurement competition for the LANTIRN targeting pod production contract between Martin-Marietta (LANTIRN FLIR targeting pod) and Ford Aerospace (improved F-18 FLIR targeting pod).

The Air Force strongly believes that the night attack capability represented in the LANTIRN program is absolutely critical to a successful war-waging potential. We will continue this important program in accordance with the full spirit and intent of guidance by the Armed Services Committees to conduct a competition for targeting pod production.

COST ESTIMATE FOR ENHANCING F-18 FLIR POD

QUESTION: What is your best cost estimate for enhancing F-18 FLIR pod to make it competitive with LANTIRN?

ANSWER: The F-18 FLIR contractor (Ford Aerospace) has provided an estimate of approximately $76 million to develop the improved F-18 FLIR pod to make it competitive with the LANTIRN targeting pod. The Air Force estimates an additional $25 million is required for test and integration on Air Force aircraft.

PROGRAM DELAY

QUESTION: How much of a delay in the program would this entail?

ANSWER: The Air Force plan for a targeting pod procurement competition retains the current LANTIRN schedule for first production delivery as August 1987.

F-18 POD CONTRACTOR

QUESTION: Didn't the F-18 pod contractor (Ford Aerospace) bid the F-18 pod modification to the Air Force and lose? Why did the Air Force turn it down?

ANSWER: The improved F-18 FLIR pod, which the Air Force has agreed to consider in a procurement competition, accomplishes only those functions performed by the LANTIRN targeting pod. However, the Ford Aerospace proposal for LANTIRN competition was based on a total system design for flying single seat aircraft at night and low altitude, acquiring tactical targets, and launching weapons.

The Ford Aerospace proposal was not selected during LANTIRN competition because the Martin Marietta proposal was determined to best satisfy selection criteria for the total system evaluated. The selection resulted in our current LANTIRN configuration of wide field-of-view FLIR on Head-Up Display, narrow field-of-view acquisition FLIR on Head-Down Display, terrain following radar, missile boresight correlator, and preplanned product improvement for automatic target acquisition.

AF POSITION ON RE-OPENING COMPETITIVE DEVELOPMENT OF LANTIRN

QUESTION: Where does the Air Force stand now on complying with Armed Services Committee language to re-open competitive development of LANTIRN?

ANSWER: The Air Force informed the House and Senate Armed Services Committees, in a letter dated 30 Mar 1982, of our commitment to conduct a procurement competition between the product improved F-18 FLIR and the LANTIRN targeting pod. Accordingly, the Air Force has reprogrammed $1.9 million of RDT&E into a separate project to be applied against Ford Aerospace pod integration and testing requirements.

WINDING DOWN F-15 PROCUREMENT

QUESTION: Turning to F-15 fighter production, the FY 1983 request is $1.3 billion for 42 aircraft. The Senate Authorization would add $108 million to make it 48 aircraft, while the House Armed Services Committee recommends cutting $404 million and making it 30 aircraft. Why shouldn't we be winding down F-15 procurement as the Air Force orginally intended instead of this dramatic program expansion you now request?

ANSWER: The Air Force had planned to initiate production of the ATF during this decade. However, delayed ATF acquisition necessitates revision of Force Structure requirements. The production rates of both the F-15 and F-16 have been aligned to achieve efficient production and to provide the aircraft required to replace normal attrition, allow retirement of older, difficult to maintain aircraft, and permit us to flesh out our 40 TFW forces.

AF EXPANSION OF F-15 PROCUREMENT OBJECTIVE

QUESTION: Why has Air Force expanded the F-15 procurement objective two and a half times over while the less costly F-16 is also undergoing a similar program expansion?

ANSWER: The Air Force had planned to initiate production of an ATF during this decade. However, delayed ATF acquistion necessitated review of force structure requirements. In the FY 82 Amended President's Budget the department advised that F-15 and F-16 planned production quantities were being reviewed for a number of reasons. The additional quantities (630 F-15's and 597 F-16's) identified for procurement through FY-90 represent a response to continuing requirements therefore, continued production of these two fighters is necessary until production of follow-on aircraft (ATF-mid 1990's) is assured. Approximately 280 aircraft per year are required for the fighter/attack forces alone, not considering other needs such as Strategic Defense, Reconnaissances and Tactical Control.

CHANGE IN THREAT PERCEPTION

QUESTION: The expansion of the F-15 program beyond 1983 calls for a total additional expenditure of $25 billion, with 13 billion being expended between fiscal years 1984 and 1987. What change in our threat perception accounts for seeking so many more of these air superiority fighters in our force structure?

ANSWER: There has not been a significant change in the perception of the threat that led to an authorized 40 TFW force in 1975. The real problem is the planned force has not been attained while the Soviets have dramatically expanded and modernized through introduction of high quality aircraft procured at rates far exceeding that of the US. Additional F-15s and F-16s are needed to modernize our strategic air defense forces and to maintain a modern, credible and balanced Force Structure until ATF production is assured.

PROJECTION ON F-15 AS AIR SUPERIORITY

QUESTION: Do we have a projection on how long the F-15 is likely to carry us as an air superiority fighter? How is this affected by coproduction agreements with foreign governments?

ANSWER: We plan to continue the F-15 as our primary air superiority fighter until the Advanced Tactical Fighter (ATF) becomes available in the mid 1990s.

We currently have licensed production in Japan and Israel, but no coproduction agreements. Specific air superiority critical technologies/capabilities were not disclosed or shared and, therefore, these agreements do not impact the continuing role of the F-15 as an air superiority fighter.

R&D FUNDS FOR F-15

QUESTION: The Air Force has requested $21 million in FY 1983 for R&D to develop a derivative of the F-16 called the F-16E. Some $26.3 million has been requested for similar R&D on the F-15E. The Air Force supposedly will choose the best aircraft capable of striking deeper, second echelon targets, missions now done by the F-4 and F-111. Why does the Air Force insist on requesting R&D funds for the F-15, strictly an air-to-air fighter, when F-16 is already a multi-mission fighter?

ANSWER: While the F-15 is currently the world's best air-to-air fighter, it also possesses many characteristics that would make it an excellent multi-mission fighter (today's F-15 has three conventional weapon air-to-surface stations). These characteristics include: long range; large payload; large avionics volume; accurate, current state-of-the-art systems; and proven combat performance.

The R&D funds requested are to enhance the capability of the current F-15. This will allow it to augment the F-111 in the low altitude, night, under the weather deep strike/attack mission.

The F-16 swing fighter is able to perform a variety of air-to-air and air-to-surface missions. However, it's range/payload is inadequate for many deep penetration missions.

A derivative of the F-16, the F-16E, is being developed to compete with the F-15E for the dual role fighter role. If the F-16E is chosen for full scale development, the Air Force plans to continue the modest air-to-surface enhancements of the F-15 C/D to expand its utility in the mid to late 80's.

ESTIMATED COST OF TWO ENHANCEMENT PROGRAMS

QUESTION: What is the total estimated cost of the two enhancement programs? What is the timing of each?

ANSWER: Detailed full scale development and production funding estimates for both the F-15E and F-16E are now being defined and will be provided in the FY 84 budget. The DEPSECDEF has directed an independent review of these costs which is currently being conducted as a part of the FY 84 budget cycle.

The program office has estimated that the cost of developing an F-15E dual role fighter is in the range of $300-350 million (then year). This would include full development, qualification and flight certification of the added avionics (missionized rear cockpit) and armament systems. The procurement cost for 400 F-15E aircraft is estimated at $16 billion (then year) and represents an increase of approximately $.9 billion or 6% over the cost of a like number of F-15Cs.

The March 1982 SAR indicated that the development cost for the F-16E program is $776.1M; however, the Program Office is presently analyzing the Research and Development cost and estimates that it will be in the range of $625-650 million (then year). This includes full development qualification and flight certfication of added avionics (missionized rear cockpit) and armament systems. The procurement cost for 400 F-16E aircraft is estimated at $12 billion (then year) and represents an increase of approximately $2.8 billion or 30% over the cost of a like number of F-16Cs.

Timing for either the F-15E or the F-16E is tied to the dual role fighter competition. With a dual role fighter selection decision in FY 83, full scale development would start in FY 84 with first delivery of an F-15E in FY 86 and an F-16E in FY 87.

AIR-TO-GROUND ENHANCEMENT OF F-15

QUESTION: Would an air-to-ground enhancement of the F-15 detract from its primary role as an air superiority fighter?

ANSWER: No, air-to-ground operations with the F-15 would provide theater commanders increased flexibility. If the aircraft is fitted with equipment to exploit it's inherent air-to-surface capability, the ability to convert the aircraft for the performance of air superiority missions would not be precluded or degraded.

FY 82 BUDGET FOR F-15E

QUESTION: Were funds for the F-15E denied in the FY 1982 budget development process?

ANSWER: The FY 82 Amended President's Budget included development funding for the F-15E. All of the proposed funding was denied, although the decision did not foreclose consideration of the F-15E, and the Air Force was tasked to provide a complete explanation of its tactical air-to-surface requirements. This explanation was provided to principal staffers of the House and Senate Armed Services Committees.

F-15/F-16 DERIVATIVE COMPARATIVE FLIGHT DEMONSTRATION

QUESTION: What is to be gained from an F-15/F-16 derivative comparative flight demonstration? Would those gains justify all the added cost and delays of two development programs?

ANSWER: The Tactical Air Forces (TAF) have identified an urgent need to increase the capability to conduct survivable, around-the-clock air-to-surface operations with substantially increased range-payloads. The best near term options to meet this need are derivatives of the F-15 and F-16 which will augment the F-111 in the air-to-surface mission, replace the aging F-4 which is being outpaced by the threat, and augment the F-15 in the theater air defense mission.

Both derivatives offer significant improvements in range-payload and in night under-the-weather capability, and retain their excellent air-to-air capability. Therefore a comparison of the F-15E and F-16E prototypes and analysis of their proposed production configurations is appropriate to determine the most effective alternative.

The flight comparison will begin in 1982 to evaluate and verify the two designs. This limited flight comparison, analysis of mission design considerations, cost, risk and schedule will be the basis for the choice of one of these derivative fighters for full-scale development and production. This decision will be made in FY 83 if appropriate funding is approved.

NEXT GENERATION TACTICAL FIGHTER

QUESTION: The Air Force is requesting $27.3 million to initiate development of a new generation tactical fighter. This program was not funded last year, and we have concerns this year as well. Why should we tackle a new fighter program at a time when we are moving into multi-year procurement on the F-16 and are considering an F-15E and F-16E derivatives?

ANSWER: The requirement for a new tactical fighter for the 1990s is driven by a continually increasing Soviet threat and growth in USAF mission needs. Over the past decade, the Soviets have introduced large numbers of highly capable tactical aircraft (Fencer, Flogger, Foxbat) that are able to carry the air war well into NATO rear areas. We depend on the qualitative superiority of our fighters (F-15/F-16) to offset this threat.

However, the Soviets are (deleted) a totally new generation of air superiority fighters (deleted) that will neutralize the qualitative advantages of the F-15 and F-16 and will enable the Soviets to exploit their traditional numerical advantage to win air superiority in a Central European conflict.

At the same time, our worldwide commitments in contingency areas such as Southwest Asia continue to grow. In order to respond effectively and efficiently to these potential contingencies, our fighter forces have a growing requirement for increased combat range and reduced logistics support. Our current fighter models cannot be expected to keep up with these evolving threats and mission requirements through the 1990s.

The derivative fighter aircraft are required to meet an immediate need for longer range and payload, night and under-the-weather tactical air operations. They will be able to flexibly augment F-111s in the medium range interdiction role and current F-15s/F-16s in the counter air role. Current and derivative fighters, however, will not retain the needed qualitative edge over the follow-on generation of Soviet fighter aircraft expected in the 1990s.

The USAF must begin to develop a new fighter aircraft for the 1990s that is more survivable and capable against the rapidly escalating threat. Lessons learned from previous development programs dictate that we begin now to systematically examine concepts and demonstrate and mature the necessary technologies so that by the planned FY 87 Full Scale Development decision point, we'll have the essential data for making a sound and proper decision.

Delay in the start of development will result in the need for a crisis response and an unnecessarily high-risk, catch-up development and acquisition process that is fraught with penalties.

PLANNING MISSION AREA ANALYSES

QUESTION: Are you planning any mission area analyses prior to initiating concept definition and develop requirement characteristics for the aircraft?

ANSWER: Two formal mission analyses have already been conducted in FY 80/81 to investigate deficiencies/requirements for the air-to-air and air-to-surface tactical air missions of the 1990s. These in-depth analyses, plus a significant number of technology requirements and effectiveness studies completed within the past five years, provided the basis for a Mission Element Need Statement (MENS) for a new fighter aircraft that was approved by OSD last fall.

The USAF has identified the desired range of design characteristics for the advanced fighter aircraft and is ready to initiate the concept development phase to examine alternative concepts.

FY 82 BUDGET REQUEST TO PROVIDE AN ADVANCED ENGINE

QUESTION: It is our understanding that this program would include a joint Navy/Air Force development effort to provide an advanced engine. This item was not included in the FY 1982 budget request. Why is it now?

ANSWER: The advanced engine development program was added to the FY 83 budget as a necessary complement to the USAF Advanced Tactical Fighter program. Experience with the F100 engine emphasizes the need for an early start on propulsion system development in order to ensure that reliable operation can be achieved in the initial production engines.

This development must be accomplished in close coordination with the aircraft design evolution to provide appropriate and mature technologies in an effective, integrated fighter weapon system for the 1990s.

A joint development effort with the Navy is considered more efficient, since both services will have similar engine requirements for the next generation of fighter aircraft.

CURRENT ENGINE DERIVATIVES AND NEW ADVANCED ENGINE

QUESTION: What is the timing of current engine derivatives and the new advanced engine? What are the estimated total costs of these programs?

ANSWER: The F101 Derivative Fighter Engine (DFE) will complete full scale development (FSD) in September 1984. For the F100 engine, the Digital Electronic Engine Control (DEEC) will be qualified by March 1984 with the improved life core qualified by March 1985. Although the details are still being developed, production of the above engines would probably not begin before 1986. F101 DFE full scale development is $123 million and the F100 DEEC and improved life core is $154 million.

Also in FY 83, the Air Force is initiating the advanced development of a new engine to meet the requirements of an advanced tactical fighter with an initial operating capability of 1993. This is planned as a competitive demonstration, joint with the Navy. Full scale development is planned for FY 1987. Advanced development program costs are estimated at $765 million for a demonstrator program and FSD costs are estimated at $700 - $800 million.

DEVELOPMENT OF NEW ADVANCED TACTICAL FIGHTER

QUESTION: What kind of capabilities will you be looking at in the development of a new advanced tactical fighter? Stealth? Short take-off and landing? Composite materials?

ANSWER: Recent mission analyses and technology requirements studies for the Advanced Tactical Fighter have clearly identified a number of increased capabilities and potential technology payoffs that must be considered for our new fighter aircraft.

The effectiveness of such characteristics as stealth and increased operating speed offer the potential for improving survivability and lethality against an increasingly capable Soviet threat. The high potential for forced operation from austere and damaged airfields indicates a payoff from Short Takeoff and Landing (STOL) capability.

Other features such as greater ferry range for worldwide deployment, increased combat radius to reach targets in potential contingency areas (e.g. Southwest Asia), and increased payload for greater lethality also appear to offer high payoff in an advanced fighter.

Improved operating efficiencies and effectiveness and lower manufacturing costs are expected from technology advances in areas like composites and Very High Speed Integrated Circuits (VHSIC). These technologies will also contribute to improved supportability characteristics so that failure rates, maintenance time, and dependence on logistics support can be significantly reduced.

WHEN WILL SOVIETS DEPLOY NEW FIGHTERS

QUESTION: When do we estimate that the Soviets will deploy a new fighter with capabilities greater than the MIG-23? Will this new Soviet fighter likely be superior to our current F-15 fighter aircraft?

ANSWER: The Soviets have already deployed the Foxhound with capabilities (deleted). We expect the Soviets to deploy (deleted) additional new fighters with (deleted). While (deleted) expected to be (deleted) in total air combat capabilities, they can be expected to (deleted). As increasing numbers of the (deleted) enter their inventory during (deleted) the (deleted) and the (deleted).

NO. OF A-10 NEEDED

QUESTION: The Armed Services Committees are in sharp disagreement on the A-10 aircraft. The House Committee is recommending adding prior year and other funds to the $357 million request to up procurement from 20 to 30 aircraft in fiscal year 1983 and to provide for 20 unrequested aircraft in fiscal year 1984. The Senate Committee would delete all fiscal year 1983 funds except for line closing costs. Does the Air Force have all the A-10s it needs (727)? Does the Army agree?

ANSWER: 727 A-10 aircraft meet the AF requirement for dedicated close air support aircraft. If required by a particular scenario, the Air Force may also use multi-purpose tactical aircraft to support the close air support mission. The Army supports the Air Force tactical fighter procurement programs.

FOLLOW-ON CLOSE AIR SUPPORT AIRCRAFT

QUESTION: Does the Air Force have any plans for a follow-on close air support aircraft? Is the Air Force abandoning the close air support mission?

ANSWER: Not at present. We are just completing our buy of A-10 aircraft which we expect to provide close air support for the remainder of this century.

ARMY CLOSE AIR SUPPORT PROGRAM INITIATIVES

QUESTION: With the Air Force limiting its involvement in this area, what can we expect to see in terms of Army close air support program initiatives?

ANSWER: The AF is not limiting its involvement in the close air support area. The Air Force, working closely with the Army, will continue to support the close air support mission.

MISSIONS/COSTS OF A-10 AIRCRAFT AND AH-64 HELICOPTER

QUESTION: How do the missions and costs of the A-10 aircraft and the AH-64 helicopter compare?

ANSWER: The Air Force views the A-10 and AH-64 as complimentary to each other. We have found in joint Army-Air Force training exercises that when you employ A-10s together with some helicopters, the mutual effectiveness of the two is greater than the effectiveness of either by themselves.

The A-10 was designed, as was the AH-64, to survive and fight in close air support. The A-10 is capable of carrying up to 16,000 pounds of external load as well as a 30 millimeter, rapid firing, high muzzle velocity gun. The A-10 does not have a night and adverse weather capability; however, the Air Force plans to add LANTIRN to some of the A-10s in the fiscal year 1986-1987 timeframe.

The AH-64 has a Target Acquisition Designation Sight and Pilot's Night Vision Sensor (TADS/PNVS) which is able to acquire, identify and engage targets during day, night and adverse weather. The AH-64 uses the HELLFIRE missile and is highly suitable for employment in all theaters of operation and in all postulated scenarios.

The unit flyaway cost of the A-10 in constant FY 1983 dollars is $7.24 million for 727 aircraft. The A-10 cost does not include the unit flyaway cost of LANTIRN. The AH-64's unit flyaway cost is $7.74 million for 446 units, and does include TADS/PNVS.

PERENNIAL "SPARES PROBLEM"

QUESTION: The Administration offered $13.4 million from the Air Force associated with spares and repair parts procurement. Has the perennial "spares problem" improved enough to make this realistic reduction option?

ANSWER: The Air Force is not aware of any Administration proposal to reduce spares and repair parts procurement.

Also, the Air Force's aircraft "spares problem" has not improved enough to make any reduction a viable or prudent option. In fact, the FY 83 Budget is just one of the first steps in solving the aircraft spare parts problem within the Air Force (deleted). The FY 83 Budget fully funds our Peacetime Operating Stocks (POS) and War Readiness Spares Kits/Base Level Self-Sufficiency Spares (WRSK/BLSS) for the first time in several years. (Deleted.) The POS spares support peacetime training and form the baseline for spare parts from which the Air Force transitions into war. WRSK/BLSS spares support the initial wartime surge while OWRM spares provide sustainability or wartime support until industrial production can satisfy consumption. (Deleted.) In order to successfully reach this goal, aircraft spare and repair parts funding cannot become a "shot in the arm" proposition. The Air Force must continue to fully fund POS and WRSK/BLSS spares in each of the years we procure sustaining OWRM spares to achieve the desired sustainability goals.

DIFFERING STANDARDS OF PERFORMANCE

QUESTION: Previous testimony from OSD witnesses indicated that the Navy has established a 70 percent mission capable rate goal for naval aircraft while the Air Force established the higher objective of 75 percent for its aircraft. What is the logic behind the differing standards of performance?

ANSWER: This answer assumes that the question refers to Volume II: Material Readiness Report (MRR) of the DOD Force Readiness Report, Feb 82 (SECRET). The Air Force cannot comment upon the Navy's mission capable rate goal. However, it must be noted that the MRR goals are not "standards of performance" and should not be used to measure relative performance. By definition, the mission capable goals are estimates of the maximum that is achievable with the design characteristics (especially reliability and maintainability) of the equipment, with planned peacetime usage, and with full funding and optimal operation of the peacetime manpower and logistics support systems. Since no system operates at its theoretical maximum, the projected MC rates represent a subjective evaluation of what can be achieved within existing peacetime constraints.

NAVY/AIR FORCE ACCEPTABLE AIRCRAFT MISSION CAPABLE RATES

QUESTION: Regardless of the goals established for acceptable aircraft mission capable rates, neither the Navy nor the Air Force expect the objectives to be achieved through 1985. Why?

ANSWER: This answer assumes that the question refers to Volume II: Materiel Readiness Report (MRR) of the DOD Force Readiness Report Feb 82 (Secret). The MRR does not establish "acceptable" mission capable rates nor does it define objectives to be achieved. The goals are, by definition, estimates of the maximum that is achievable with the design characteristics (especially reliability and maintainability) of the equipment, with planned peacetime usage, and with full funding and optimal operation of the peacetime manpower and logistics support systems. The projected MC rates over the FYDP are judgemental evaluations of what MC rates might be possible given the constraints expected to exist over the FYDP and are not a measure or standard of performance.

STANDARDIZATION OF AIR FORCE & NAVY GROUND SUPPORT EQUIPMENT

QUESTION: GAO estimates that the Navy and Air Force spend over $1.2 billion annually for ground service and maintenance systems. Both military services are experimenting with centralized ground support at airfields, but GAO feels that savings are being lost because the Air Force and Navy are using different equipment rather than standardized items. Is there any reason why Air Force and Navy ground support equipment shouldn't be standardized items.

ANSWER: The Office of the Secretary of Defense (OSD) is presently establishing an Aircraft Ground Support Equipment Panel under the Defense Material Specifications and Standards Board. This panel will provide the Air Force, Army and Navy a forum for recognition of interservice common support requirements. The Air Force plans to use this panel to identify those items of support equipment, such as cnetralized aircraft support systems, that can be standardized DoD-wide. To accomplish this, we plan to use the Air Staff chartered Aircraft Ground Support Equipment Working Group, the purpose of which is to identify standardization issues within the Air Force. We will use this group to identify standardization issues for presentation to the OSD's Aircraft Ground Support Equipment Panel.

FY 83 BUDGET SAVINGS FROM CENTRALIZED SUPPORT

QUESTION: The DoD response to GAO's finding was that savings from centralized support are reflected in the DoD budget. How much is reflected in the FY 1983 budget?

ANSWER: The FY 1983 operation and support savings from use of centralized aircraft support systems (CASS) will result from continued use of the only such system currently operational in the Air Force. This system is located at Randolph AFB, Texas. The Productivity, Reliability, Availability and Maintainability (PRAM) Program Office, located at Wright-Patterson AFB Ohio, conducted a test which compared support of 36 aircraft (T-38A) using the Randolph AFB CASS with support of another 36 aircraft at the same location using mobile ground equipment. Based on the results of this test, the annual cost savings resulting from use of this CASS can be estimated as follows:

1. Mobile Ground Equipment Annual Operation and Support Cost:

Personnel	$1,516,200
Maintenance	837,900
Fuel	970,900
Total	$3,325,000

2. CASS Annual Operation and Support Cost:

Personnel	$ 219,198
Materials	83,015
Electric Power	87,500
Overhauls	35,000
Total	$ 424,713

3. Total with Mobile Equipment $3,325,000

Total with Mobile Equipment	$3,325,000
Total with CASS	424,713
Total Annual Savings	$2,900,287

WHY NOT MORE SAVINGS IN BUDGET?

QUESTION: It would seem that the greatest opportunities for savings from centralization similar to commercial airline practices would be with Military Airlift Command operations. Why aren't there more savings reflected in the budget in this area?

ANSWER: The savings to be accrued through application of Centralized Aircraft Support Systems (CASS) to Military Airlift Command (MAC) operations are not reflected in the budget because these items have not yet been installed. In accordance with a recommendation from the GAO, we are now embarking upon development of a standard CASS for application Air Force-wide. When this development effort is completed and the standard CASS has been defined, we will begin installing systems at MAC bases; we will begin to accrue savings only as these systems are put into operation.

AF AND NAVY WORK ON A JOINT JAM RESISTANCE SYSTEM

QUESTION: The Air Force is requesting $77.3 million, a 50 percent increase, to complete full scale development of SEEK TALK, a program to provide jam resistance for all UHF voice communications. The Navy, meanwhile, will use JTIDS, a digital network for its communications. Why can't the Air Force and Navy work on a joint jam resistance system? Does the Air Force have some unique requirement for secure voice communications due to the threat posed by land-based jammers?

ANSWER: The primary missions of the Air Force and Navy differ considerably. Air Force current concepts and proven tactics are based on voice communications. The environment in which the Air Force would fight in Central Europe will be unstructured and dynamic, lending itself to the unformated nature of voice communications.

(Deleted.) The communication capacity required to support these missions is beyond that of current data systems. (Deleted.)

ANTENNA TECHNOLOGY FOR SEEK TALK

QUESTION: Has the antenna technology for SEEK TALK matured to a high level of confidence? How many nulling antennas are required for the SEEK TALK system?

ANSWER: SEEK TALK Concept Validation equipment underwent extensive testing. These tests indicated that adaptive antenna technology is a viable technical approach to providing jam resistance. At this time the installation of multiple antennas on aircraft is expensive. The SEEK TALK program has been directed to retain adaptive antennas as a growth option for the 1990's and if implemented would use as many as (deleted) in the array. Initial installations are not envisioned to use adaptive antennas.

ALTERNATIVE TO SEEK TALK

QUESTION: Could an austere JTIDS configured as a voice only system be a comparable long-term alternative to SEEK TALK?

ANSWER: An austere JTIDS is not a comparable long-term alternative to SEEK TALK. (Deleted.) Even if

JTIDS were to be used for voice this requirement would conflict with the system communication capacity allocated to data. An alternative, high antijam voice system complements the data capabilities of JTIDS.

HAVE QUICK COMPARABLE WITH SEEK TALK

QUESTION: Could the interim HAVE QUICK system perform comparably with SEEK TALK?

ANSWER: The interim HAVE QUICK system cannot perform comparably with SEEK TALK. (Deleted.)

JAM-RESISTANT SECURE VOICE COMMUNICATIONS SYSTEM

QUESTION: SEEK TALK is a $3 billion acquisition program. The GAO contends that the Jam-Resistant Secure Voice Communications System could offer savings of up to $1.6 billion and provide capabilities equivalent to SEEK TALK. What is the Air Force response to the GAO alternative, JRSVC?

ANSWER: The Air Force has been pursuing the Lincoln Laboratory Jam Resistant Secure Voice Communication (JRSVC) System as a technical alternative to SEEK TALK. The SEEK TALK program is now incorporating the key technologies developed by the Lincoln Laboratory JRSVC program. Budgetary analyses are being conducted to determine the extent of savings.

AF AND NAVY DEVELOPING SEPARATE JTIDS TECHNOLOGIES

QUESTION: The Air Force is requesting $52.5 million to develop a JTIDS system using the Time Division Multiple Access technology. The Navy is requesting $100.3 million to develop a JTIDS system using the Distributed Time Division Multiple Access technology. Why are the Air Force and Navy developing separate JTIDS technologies?

ANSWER: The Air Force/Army Time Division Multiple Access (TDMA) terminal is optimized for the large communities of users that are involved in air/land tactical operations. The Navy/ Marine Corps Distributed TDMA (DTDMA) JTIDS is optimized for the numerous smaller communities of users found in Battle Group operations. The DTDMA terminals will have a TDMA mode for interoperability in joint scenarios.

NAVY'S DTDMA SYSTEM VS AF TDMA

QUESTION: Does the Navy's DTDMA system have greater growth potential than the Air Force's TDMA? Wouldn't it be desirable for the Air Force to have this potential? Do each of your plans include the use of Very High Speed Integrated Circuit (VHSIC) technology?

ANSWER: The TDMA and DTDMA system approaches and hardware designs are optimized for different general environments; therefore, the value of growth potential is relative to the scenario in which they will be employed. The throughput capacity of the Air Force/Army TDMA system has already grown, through improvements added during development, from the 28,800 bits per second of the AWACS terminal to the 238,000 bits per second of the fighter terminal. The fighter terminal will allow the E-3A/Tactical Air Control System information net to be extended to air-to-air fighters and the Army air defense network, with a reserve capacity for local use.

Very High Speed Integrated Circuit (VHSIC) technology will be inserted in JTIDS as VHSIC is developed. The DTDMA terminal, which started full scale development one year behind the TDMA Class 1 terminal, will have at least one VHSIC component.

NAVIGATION POSITIONING WITH NAVSTAR GPS

QUESTION: Will JTIDS, which has terminals in the air aboard AWACS aircraft, help eliminate the need for costly sets used for navigation positioning with NAVSTAR GPS?

ANSWER: No. JTIDS can accurately locate aircraft relative to other JTIDS net participants in two dimensions (e.g., latitude, longitude). It does not, by itself, provide accurate altitude or position in earth referenced coordinates. The relative positioning is designed to facilitate radar track coordination and identification.

Navstar GPS, on the other hand, provides precise three dimension position information (e.g., latitude, longitude, altitude) world-wide, even if the platform is operating by itself. The GPS precise three dimension positioning capability supports accurate all-weather bombing, air drop, non-precision approaches and a host of other military requirements.

ASSESSMENT OF ASPJ CAPABILITIES

QUESTION: The ASPJ is a joint Air Force/Navy program for an internally mounted electronic countermeasures system for various tactical aircraft such as the F-16, F-14, F/A-18 and A-6E. The Air Force FY 1983 budget request for ASPJ is $110.2 million. The Navy is requesting $29.3 million for ASPJ in FY 1983. The GAO said last April that ASPJ is not designed to cope with all threats, and that new capabilities will be required. Is this your assessment of ASPJ capabilities?

ANSWER: The AF FY 83 budget request for the ASPJ program is $46.7 million. $110.2 million appears to be the total program estimated RDT&E cost.

The ASPJ is being designed to electronically jam radar guided terminal threats operating in the frequency range (deleted). The DOD concurs in the need to counter additional threats that operate outside the ASPJ specified frequency range. The physical properties in that part of the electromagnetic spectrum, the technology and engineering necessary to counter infrared, electro-optical and additional segments of the radio frequency spectrum preclude incorporating these capabilities into one system.

SAVINGS TO THE GOVERNMENT

QUESTION: Has the joint ASPJ program resulted in significant savings to the government?

ANSWER: When comparing the cost of developing a single self protection system for multiple aircraft versus developing separate systems for three separate aircraft (F-16, F-18 and F-14), the cost savings are estimated to be $200 million. Common development has resulted in more efficient use of manpower and facilities. Competition and industry teaming have provided the best design and system capability for the dollars spent.

For production, the cost savings are estimated to be approximately $200 million ($100K per system for 2000 systems), derived from the economics of large volume production runs. For support, the cost reduction will approach $500 million. In total, a savings of about one billion should be realized from this joint effort while providing a self protection capability that meets the Services requirements for the late 1980's and beyond.

SIGNIFICANT TECHNICAL OR COST-RELATED PROBLEMS

QUESTION: Has ASPJ experienced any significant technical or cost-related problems in the past year?

ANSWER: The ASPJ program has not experienced any significant technical or cost-related problems in the past year.

CAN RAPPORT III CONTRACTOR MEET OCTOBER 1 DEADLINE

QUESTION: The Department told the subcommittee last month it could not comply with congressional direction to evaluate RAPPORT III as an interim alternative to ASPJ. Can the RAPPORT III contractor meet the October 1 deadline set by the appropriations conference report for completion of all relevant testing by the Belgian Air Force?

ANSWER: The Belgian Air Force (BAF) informed NATO Air Group III during April 1982 that the two RAPPORT III prototypes were returned to the contractor in March 1982 to correct shortcomings identified during the yearlong flight test at Eglin AFB, FL and to complete the remaining contractual acceptance testing. The BAF "estimated that this might take up to one additional year." Based on this time table, BAF testing cannot be completed by October 1, 1982.

FURTHER EVALUATION OF RAPPORT III

QUESTION: Why does the Air Force think further evaluation of RAPPORT III is unnecessary? Does the Air Force favor terminating any further US involvement with Belgian Air Force testing of RAPPORT III?

ANSWER: Cooperative Belgian/USAF flight testing at Eglin AFB, FL confirmed our previous engineering analysis that RAPPORT III does not satisfy USAF requirements to detect and counter future sophisticated agile radar threats. System problems forced the change of testing from IOT&E to DT&E objectives. The initial IOT&E objectives were never accomplished by USAF standards.

The USAF is in favor of terminating USAF evaluation of the RAPPORT III system. We do believe US test facilities should be made available to the Belgians, if requested. However, we will comply with the direction of Congress.

IS AMRAAM ENCOUNTERING PROBLEMS?

QUESTION: The R&D request for the Advanced Medium Range Air-to-Air Missile (AMRAAM) is up over 25 percent to $207.6 million, and the total estimated program cost is up over 85 percent (to $798.8 million) from last year's estimates. Would it be correct to conclude that this program is encountering difficult - and risky technology problems?

ANSWER: No. As in all development programs, there are some areas of technical risk in the AMRAAM program. However, none of these technical challenges are considered high risk. Certainly, integrating the technology into a workable system is a challenge;

however, most of the integration concept was demonstrated during the validation phase.

Several factors have caused this year's estimate for AMRAAM development to be higher than estimated last year. The design of the missile that Hughes Aircraft Company is on contract to develop is more complex than previously estimated; the weight and parts count are greater. The costs to design modifications and modify development test aircraft will be greater than previously estimated. We have also increased emphasis on reliability and maintainability to design in reliability early in Full Scale Development (FSD) to hold down life cycle costs.

Last year's estimate was prepared about halfway through system validation and was based, to a large extent, on contractor estimates; our current RDT&E estimate for AMRAAM is based on a negotiated/awarded fixed price incentive type FSD contract with no provisions for economic price adjustment. The impact on cost of using this type contract is difficult to quantify. However, as a minimum, the contractor had to provide inflation protection in his bid.

FOLLOW-ON CONTRACTOR FOR AMRAAM

QUESTION: Now that a contractor has been selected for a four year full scale development program, what will be done to keep a follow-on contractor in the program for eventual production buy competition? How much has been budgeted to keep a follow-on contractor in the program during fiscal year 1983?

ANSWER: An eventual second source competitive producer for AMRAAM will be developed through a leader-follower concept beginning in FY83 during Full Scale Development (FSD). During FSD, this follower will verify the Open Competition Reprocurement Data Package and will prepare for early production. During initial production, the follower will first co-assemble missiles using leader produced parts, then co-produce AMRAAMs using his own subsections.

During FY83 $10.0M has been budgeted for the follower effort.

ESTIMATE FOR UNIT PRODUCTION COST FOR AMRAAM

QUESTION: Based on our understanding of the requisite components - especially the guidance system - what is the estimate of unit production cost that is currently being projected?

ANSWER: Based on an assumed Air Force and Navy procurement of 20,000 missiles, the projected average unit production cost is $113,200 in Base Year FY78 dollars.

RATE OF PROCUREMENT

QUESTION: With production deliveries beginning in 1985, what rate of procurement is planned to support replacement of current missiles?

ANSWER: The current production plan is based on starting deliveries in September 1985 at a rate of 8 missiles per month and increasing to a rate of 250 missiles per month by the end of Lot III (FY87 procurement). A 60 percent/40 percent Air Force/Navy split of this combined, dual-source production rate is planned beginning in FY88. The production rate of 250 missiles per month could be increased, if required.

FULL SCALE PRODUCTION PHASE OF INFRARED MAVERICK PROGRAM

QUESTION: Because of a need for further testing, the Air Force has deferred entering a full scale production phase of the infrared Maverick program. What is the impact of this action on the fisal year 1983 request for 2,560 missiles at a cost of $343 million?

How many missiles will be required for further testing?

ANSWER: The slower build up in IR Maverick to full scale production reduces the FY 83 buy to 1335 missiles. The procurement funds (Weapon System plus Initial Spares) necessary are $281.1 million. Five missiles are required to support FY 83 testing. These missiles will be obtained from current assets. The missiles for Follow on Test and Evaluation will come from pilot production.

FULL SCALE PRODUCTION START-UP COSTS

QUESTION: Will any portion of the remaining fiscal year 1983 request be used for full scale production start-up costs prior to having the results of further testing and making a decision on this program's future?

ANSWER: FY 83 funds will not be used for full scale production start-up costs. A full rate production decision will be made in May 84 after further testing is completed.

PLANS TO ACQUIRE 61,000 MISSILES

QUESTION: Does the Air Force still have plans to acquire 61,000 of these missiles at a cost of approximately $5 billion?

ANSWER: Yes, the Air Force plans to buy 60,664 IR Maverick missiles. Program cost estimates are currently being validated and will be provided as soon as possible.

PROSPECTS FOR LOWERING THE UNIT COST

QUESTION: What are the prospects for lowering the unit cost of the Maverick missile below $134,000 each?

ANSWER: The IR Maverick average procurement unit cost for the total buy is estimated to be $93,000 each. Currently, there are three cost reduction activities aimed at reducing production cost. First, development of a competitive environment by bringing on a second source for IR Maverick missiles production. Second, ECP 604 is a direct engineering effort to improve the IR Maverick design for producibility. Third, early initiation of a value engineering program to improve producibility.

REDUCE FUNDING BY ONE HALF

QUESTION: The Senate Armed Services Committee is recommending that Maverick quantities for fiscal year 1983 be cut in half (from 2,560 to 1,335) while reducing the funding by only 21 percent. Why shouldn't this committee reduce the funding by one half in line with the quantity reduction?

ANSWER: The Air Force recommended and OSD approved the slow down of IR Maverick entry into full rate production. The reduced quantity buy in FY 83 results in a per unit cost increase in FY 83 caused by the less efficient production rate, and the reduced prior year buy. Weapon System procurement funding of $270.6 million is required in FY 83 to obtain the planned buy of 1335 missiles.

VISUAL ATTACK MISSILE PART IN FUTURE

QUESTION: The plan to procure 1920 Sidewinder missiles in fiscal year 1983 at a cost of $115 million indicates that this is a relatively inexpensive item ($60,000) in our tactical missile arsenal. What part will this visual attack missile play in the future vis-a-vis its more sophisticated day/ night, all weather counterparts?

ANSWER: The Air Force will have a continuing need for passive, infrared seeking missiles through the 1990s. The AIM-9 is an essential complement to our radar guided air-to-air missiles and offers unique operational features. This denies the enemy the opportunity to concentrate his countermeasure efforts.

Specifically designed for close-in, within-visual-range (WVR) engagements, the AIM-9 allows our fighters to engage enemy aircraft without alerting the pilot through electronic emissions. It is not susceptible to electronic countermeasures (ECM) and it provides aircraft which do not possess sophisticated radars, avionics, or radar missiles with a self-defense air-to-air weapon that exceeds gun capabilities.

A short range engagement is an air-to-air fact of life either because (1) there is a shortage of radar missiles, (2) the aircraft has already expended its radar missiles or (3) initial contact occurs at visual ranges. Therefore, AIM-9 production should continue to correct our inventory shortage and to provide an improved missile that takes maximum advantage of the F-15/F-16 fire control systems and maneuvering capabilities.

ELIMINATE 4,000 SIDEWINDERS

QUESTION: Why shouldn't we eliminate some of the 4,000 Sidewinders programmed to be funded in fiscal year 1983 through 1985?

ANSWER: AIM-9M production should continue through FY85 to correct our inventory shortage and to provide an improved within-visual-range missile that takes maximum advantage of the F-15/F-16 fire control systems and maneuvering capabilities. The capability of our tactical forces to achieve air superiority over the battlefield would be significantly degraded if we reduce AIM-9M buys.

The AIM-9L and AIM-9M have demonstrated excellent operational performance for both the U.S. and our allies. The AIM-9M will continue to provide the unique forward aspect capability and will also provide improved infrared counter countermeasures (IRCCM), better acquisition and tracking ranges, a reduced smoke motor, and a closed cycle cooler (less support equipment required).

A reduction in AIM-9M buys would cause production inefficiencies and increase unit price, thereby impacting our ability to comply with the Congressional mandate for efficient weapon production. If the reduction caused us to revert back to sole source procurements after qualifying a second source in FY82, the unit price increase would be even more significant. This would deny us the opportunity to take advantage of the investment in a second source. The unit price impact would depend on the magnitude and timing of any reduction.

ALL-WEATHER COUNTERPARTS JUSTIFY GRADUAL REPLACEMENT

QUESTION: Does the state of development of all-weather counterparts of this missile justify its gradual replacement in our missile inventories?

ANSWER: Assuming the question refers to possible replacement of AIM-9 series missiles, the Air Force believes there is and will be a continuing need for passive, infrared-seeking missiles in its inventory through the 1990s.

The current buy of AIM-9M SIDEWINDER will be completed in FY 85. This will allow the Air Force to fully equip its F-15 and F-16 aircraft with AIM-9Ls and improved AIM-9Ms. Our attack aircraft will have a self-defense capability with the AIM-9P.

In comparison to all-weather missiles, AIM-9 has a substantially lower unit cost and offers operational features which complement those of the AIM-7 SPARROW and the AIM-120 AMRAAM. Specifically designed for the close-in, within-visual-range (WVR) engagement, AIM-9 allows our fighters to engage enemy aircraft without alerting the pilot through electronic emissions. It is not susceptible to electronic countermeasures (ECM) and it provides aircraft which do not possess sophisticated air-to-air radars and avionics with a self-defense air-to-air weapon that exceeds gun capabilities.

The Air Force considers the AIM-9 to be an essential complement to our radar-guided missiles. We see the AIM-9 as the simple alternative in a high-low weapons mix of air-to-air missiles. When AIM-120 completes its flight test program in 1986 and we know more about its full capabilities and utility, we will be able to adjust our future requirements if that appears warranted. We do not plan to replace our AIM-9 stockpile, however, because of its necessary and complementary features and the flexibility it provides in the air-to-air arena.

The Air Force does not plan to buy another short range air-to-air missile until (deleted) when we expect to begin procurement of the Advanced Short Range Air-to-Air Missile (ASRAAM). ASRAAM will be developed and produced by a West German and British industrial team. It should provide substantial improvement over AIM-9 to allow us to outshoot projected enemy short range missiles through the 1990s. ASRAAM will be specifically tailored for within-visual-range engagements to complement AIM-120's performance at longer ranges.

LOGISTICS PROBLEMS TO MAINTAIN VISUAL ATTACK AND ALL WEATHER TACTICAL MISSILES

QUESTION: What are the logistics problems of maintaining both visual attack and all weather tactical missiles in our readiness inventory?

ANSWER: We are experiencing no particular logistics problems directly attributable to maintaining two different types of tactical missiles, both visual attack and all weather, in our war reserve inventory. The predominate problem associated with tactical missile logistics involves having sufficient missiles in the inventory to meet theater War Reserve Materiel requirements.

35% COST GROWTH IN GUIDANCE AND CONTROL SECTION

QUESTION: For fiscal year 1983 funding is requested for 1,300 Sparrow missiles at a cost of $199 million. What effect has the 35 percent cost growth in the guidance and control section had on the quantities requested for fiscal year 1983?

ANSWER: The cost growth reduced the missile quantity that could be procured with the available funds from 1430 to 1300 missiles.

REEVALUATION OF PLAN TO ACQUIRE 16,000 MISSILES

QUESTION: Has the spotty test record of this missile in the look-down mode led to a reevaluation of the plan to acquire 16,000 of them?

How does continuing development on this missile system dovetail with high levels of production buys?

ANSWER: The Air Force still supports the AIM-7M program. AIM-7M missiles are needed to provide an improved medium range air-to-air missile for the F-15 and to correct our current inventory shortage. While the initial IOT&E results were not as successful as expected, fixes for the deficiences have been identified, verified, and incorporated into the first production missiles (FY80 Funds).

IOT&E is scheduled to be complete (Sep 82) prior to high rate production of the FY81 buy. These tests will provide additional data to verify the adequacy of the design changes. As a minimum, AIM-7M production should continue through the FY84 buy.

COMMON DEVELOPMENT OF FUTURE PRIMARY AND ADVANCED TRAINERS

QUESTION: We have two requests in the FY 1983 budget for continued R&D on trainers. The Air Force has requested $52.3 million for its new primary trainer, called the Next Generation Trainer (NGT). The Navy is asking $9.7 million for development of a new advanced undergraduate trainer, called the VTX. What initiatives are the Air Force and Navy taking to plan for the common development of future primary and advanced trainers?

ANSWER: The Navy and AF signed a Memorandum of Understanding (MOU) on the Development and Acquisition of Trainer Aircraft for Pilot Training on 5 May 81. The MOU tasks both the AF and Navy to ensure a continuing interface in their trainer acquisition programs. Milestones and corresponding coordinating actions are listed for each step of the NGT and VTX programs. Because it is not practical for the AF and Navy to use a single aircraft to satisfy the AF primary trainer requirements and the Navy advanced trainer requirements, the MOU ensures that the two aircraft under development will be capable of being used by both services should the need arise for that type of aircraft. Specific examples of AF/Navy involvement with both programs follow.

The AF reviewed the Navy VTXTS Request for Proposal (RFP) and identified areas of concern (performance) and areas of excess capability (carrier suitability) to the Navy. In the Summer 1981, an AF team also reviewed the VTX concept phase contractor proposals. Their analysis was provided to the Deputy for Plans, HQ Air Training Command (ATC), for use on the VTXTS source selection advisory council in November 1981.

Subsequent to the Navy's selection of the BAE/McDonnell Douglas Hawk as the VTX, the Air Force hosted a meeting in Feb 1982, at HQ Air Training Command. Attendees included personnel from McDonnell Douglas engineering and management, the VTXTS program staff, Navy training command, HQ USAF, and ATC. The meeting objectives were to allow the AF to assess the capability of the Hawk and any potential Hawk derivatives and to provide McDonnell Douglas with insight into AF requirements for a T-38 replacement. The Navy will include provisions in the VTXTS Full Scale Development contract to enable the AF to obtain McDonnell Douglas data as necessary to continue the Air Force assessment of the Hawk.

As the Navy VTXTS program evolves, the AF intends to remain involved with both the Navy and McDonnell Douglas to continue to assess the suitability of the Hawk as a T-38 replacement should the need arise.

The Navy reviewed the Draft Request for Proposal for the NGT and concluded that they would make only minor changes in the avionics suite and ejection seats. The Navy also would want aircraft embedded computers and support equipment computers if the NGT were a Navy trainer. The Assistant Chief of Staff for Plans and Programs on the Staff of Chief of Naval Air Training was a member of the NGT Source Selection process. On 18-19 May, the VTX program manager, visited HQ ATC to discuss AF training procedures and to fly the T-38 trainer. In accordance with the MOU, Navy personnel will attend quarterly AF program reviews once an NGT contractor is selected.

AIR FORCE EVALUATION OF T-34C

QUESTION: The Air Force opposed the use of the Navy turboprop T-34C for its new basic trainer, and this Committee supported that position last year and funded the NGT. What were the principal findings of the May 1981 Air Force evaluation of the T-34C as an NGT alternative?

ANSWER: The Air Training Command study of May 1981 found the T-34C unsuitable as an NGT alternative because of its low performance capabilities and incompatibility with the Air Force training environment. To use the T-34C as the Air Force primary trainer would result in severe training shortfalls unless costly expenditures to procure additional training bases, aircraft, facilities, and personnel were made. The T-34C was found to be approximately $3B more expensive than the NGT over a 20 year life cycle. Studies by the GAO and ANSER Corp. (an independent research organization) had similar conclusions.

T-34C MORE COSTLY THAN THE NGT

QUESTION: The GAO found that although the T-34C could be used by the Air Force, it would result in additional flying hours, a longer training cycle and a transition to a jet performance trainer. Do these factors, combined with other costs such as added fuel and O&M, actually make the T-34C more costly than the NGT?

ANSWER: Yes. In addition to the GAO study, studies by the Air Training Command (ATC) and ANSER Corp. (an independent research organization) determined that the total undergraduate pilot training program would be more costly using the T-34C than the NGT for the reasons mentioned. The ATC study found the T-34C to be approximately $3B more expensive than the NGT over a 20 year life cycle.

PROGRAM ELEMENT AFFECTED BY THE CONSOLIDATED CRUISE MISSILE PROGRAM

QUESTION: Consolidation of cruise missile programs permits a reduction in the Air Force RDT&E request of $42.7 million dollars. Which program elements are affected by this change?

ANSWER: The consolidation planned for this summer is expected to permit a reduction of at least $42.7 million. We cannot cite a line item since we have not yet decided which programs will be affected.

CENTRAL PROJECT RESPONSIBILITY FOR CRUISE MISSILE DEVELOPMENT

QUESTION: Will there now be central project responsibility for cruise missile development?

ANSWER: We expect that common components will be purchased centrally no matter what programmatic decisions are made. Other specific project responsibility decisions will be made after the technical decision process has been completed.

FUTURE COST SAVINGS FROM CONSOLIDATION ACTION

QUESTION: Can we expect to derive future cost savings from this consolidation action?

ANSWER: Yes, however the savings cannot be specified at this time.

STRETCHING OUT THE PROGRAMMED BUILDUP

QUESTION: The Air Force and Navy submissions show similar requests for about 200 HARM missiles each. The restructured program leads to downward adjustment of the Air Force request by $69 million (to $91 million) and the Navy request by $81 million (to $96 million). Why are we now stretching out the programmed buildup in this acquisition program?

ANSWER: The Air Force fully supports the vital HARM program. However, the Air Force HARM program was decremented by $69 million due to overall FY83 fiscal constraints. The FY83 downward adjustment delays achievement of higher production rates, defers second source qualification, and reduces the FY83 buy to 136 missiles.

TECHNICAL OR PERFORMANCE PROBLEMS WITH AGM-88A HARM

QUESTION: Have we discovered technical or performance problems with this missile?

ANSWER: The AGM-88A HARM is performing well during our operational testing and evaluation. As in all new weapon system development programs, problems have occurred during testing. Corrective actions have been taken and we expect the inventory missiles to meet the requirements as stated in the Services Selected Acquisition Report. The USAF initial delivery into inventory is still planned for November 1983, with an initial operational capability planned for (deleted).

DEFERRAL OF SECOND SOURCE QUALIFICATION

QUESTION: If total quantities to be procured remains the same, why is the second source qualification being deferred?

ANSWER: The Air Force has an urgent need for the HARM missile. We are addressing our inventory requirements now by maintaining a minimum adequate production base with the current producer. The continuance of second source qualification during FY83 at the expense of inventory missiles would be both inefficient and uneconomical.

Department of the Navy

U.S. Marine Corps

STATEMENTS OF:

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COMMODORE JOHN C. WEAVER, USN, F/A-18 PROJECT MANAGER

COL. JAMES W. ORR, USMC, AV-8B PROJECT MANAGER

INTRODUCTION OF WITNESSES

Senator **Andrews**. Our next group of witnesses is our friends from the Navy, who, we hope, can tell us how to keep them floating when you have a tough Air Force like the Argentines to face.

If we can have the Navy and the Marines come up together, we will now proceed with the Navy and the Marine witnesses on tactical aircraft.

Admiral McDonald and General White, we are pleased to welcome you back. I must stress again our time is limited. I hope you will keep your opening presentations brief.

As you know, your prepared statements will be printed in the record. When you begin, I would appreciate it if you would introduce those testifying with you and proceed with the presentations after our colleague, Senator Stennis, asks some questions of General White.

Senator **Stennis**. Mr. Chairman, I certainly thank you for recognizing me. Like everyone else, including our witnesses here, we are in a bind around here this week. We have to go from one place to another.

AV-8B

General White, I want to direct your attention to the AV-8B.

Gentleman, this is what I call a legislative plane. In other words, this idea originated in the legislative branch of the Government, authorizing and appropriating for 2 years, you may remember, Senator Andrews, before it got into the budget, so I have a little follow-along interest in it for that reason.

I do want to know from General White how things are working out with it. I also want to get into this Falkland Islands situation down to the south.

Mr. Chairman, if I may ask these questions quite briefly: First, about the design changes now, do we understand correctly that the change being incorporated will reduce the pilot workload and improve flight characteristics as planned, and make the aircraft safer?

General WHITE. Yes. We have looked at the AV-8B after 10 years of experience.

Senator RUDMAN. You might remind the witnesses that our PA system is not working.

General WHITE. I will begin again.

We have been looking at the AV-8A for the last 10 years, proving operational concepts. We have also been looking at the safety aspects of that aircraft. It represents 1950 technology. It is old by today's standards. Through our experience we have designed out, we believe, all the safety-related deficiencies in both the engine and the airframe. With the AV-8B you have a new aircraft, but based on the technology proven by the original AV-8A.

The engine will have all the reliability and maintainability features to make it a good, safe, reliable engine.

As far as pilot workload, you must understand that pilot workload in the original AV-8A makes it a difficult, demanding aircraft to fly. The pilots have to stay with it all the time; whereas, with the new AV-8B we have reduced the pilot workload by 65 percent. That is not just U.S. test pilots. Mr. John Foley, the foremost V/STOL test pilot for the United Kingdom, 20 years in the business, has substantiated the reduction in the pilot workload. We have made numerous changes in the AV-8B to make it a safer and more reliable aircraft.

I will be happy to go into more detail. In fact, I have test pilots here with me today whom I will be happy to make available to the committee to go into any detail you like.

I am also prepared to talk about the Falkland Islands, if you would like.

Senator STENNIS. Mr. Chairman, I am not going to be lengthy, but it is a vital matter.

HARRIER IN FALKLAND ISLANDS

Let me ask one question. We read these media reports about the Falkland Islands conflict and U.K. Harrier successes. How do you assess that from the information you have?

General WHITE. Senator Stennis, first of all, the information I have is out of the public domain but we in the Marine Corps have a very strong interest in the performance of the Harrier aircraft any time it is committed to combat. Since this is the first time a Harrier aircraft has been committed to conflict—we have been following it closely.

First of all, they are using the Sea Harrier down there, which differs only slightly from the aircraft we have, the AV-8A, and only slightly from the British RAF Harrier called the GR Mk3.

The Sea Harrier has had remarkable successes, as we see it, in air-to-air engagements. Depending on the source, I calculate that they have destroyed to date in air-to-air engagements 18 to 20 Argentinian aircraft, all through the use of the Sidewinder missile. They have not lost a single Harrier in air-to-air engagements. They have used their remarkable turning ability through vectored thrust to get position on the Argentine aircraft.

You must understand that the Argentines have some very modern aircraft in the Mirage series aircraft, so they are not all flying obsolete aircraft.

Operational losses, yes, they have lost by my count six British Harriers. Three have been shot down through groundfire by antiaircraft weapons, of what caliber I don't know, and by missiles, of what type I don't know. They have experienced three operational losses, a midair in bad weather and an unexplained crash after takeoff, a minute after takeoff from one of the ships.

The Harriers have engaged in ground attacks against Argentine ground installations. They have damaged the Argentine runways at Goose Green and at Stanley. They have destroyed helicopters and also fixed-wing aircraft on the ground.

So, they have contributed to the ground battle.

In my estimation, the RAF Harriers, as distinct from the Sea Harriers, that have come down on the *Atlantic Conveyor,* will very shortly be placed ashore and start operating from within the British lodgment to carry on the close air support for the British troops.

I might add that this method of basing coincides exactly with the Marine Corps' intended way of utilizing the Harrier should we be committed to a combat situation and amphibious operations.

AV-8A AND B RELIABILITY

Senator STENNIS. Mr. Chairman, certainly the Falkland Islands situation puts the AV-8A and B up front. We have a special interest in it.

I have a few questions on this and related matters. In the interest of time—and you gentlemen doubtless have questions, too, for General White—I ask unanimous consent that they may be put in the record.

Senator ANDREWS. Without objection, Senator Stennis.

Senator STENNIS. You will give these additional questions your personal attention?

General WHITE. I will be happy to.

[The questions and answers appear at the conclusion of the hearing.]

Senator ANDREWS. You said something about having pilots here with you?

General WHITE. Yes, sir, we have a Marine pilot and a McDonnell-Douglas test pilot here.

Senator STENNIS. If the chairman sees fit to go into that, it would be interesting.

Senator ANDREWS. We may well, if we have the time.

Senator STENNIS. I will stay as long as I can.

Thank you very much, Mr. Chairman.

Senator **Andrews**. If you will proceed.

Resumed Statement of Vice Adm. Wesley L. McDonald

INTRODUCTION OF ASSOCIATES

Admiral **McDonald**. Again, it is a pleasure to be with you and the other members of the committee. I know I speak for the other Navy-Marine Corps team that accompanies me.

You have already met General White, who is Deputy Chief of Staff for Aviation Matters in the Marine Corps.

On my left is Vice Adm. Ernest R. Seymour, Commander of the Naval Air Systems Command.

In the background for backup and any specific questions you may have relative to research and development, technologies, and evaluations, are Admiral Prindle, and Admiral Hostettler, from the surface warfare side, who might be able to answer some specific questions relative to the LAMPS program if you get into questions which lead to installations on our ships that are aviation oriented.

Other than that, there are several program managers, both from the Marine Corps AV-8B, the F/A-18 and MK III LAMPS program, who are here, sir.

I have, as you noted, submitted a written statement and would ask that it be included in the record.

Senator **Andrews**. It will be placed in the record in its entirety.

Admiral **McDonald**. In my oral remarks this morning I will present only the essentials of the naval aircraft procurement request, Mr. Chairman. I would then suggest that I yield the floor to General White so that he could then explain those unique aviation programs which the Marine Corps is responsible for administering, so that you will get a full overview of the total Navy picture.

Following his remarks, all of us will stand ready to answer any of the questions you or any other members of the committee may have.

The fiscal year 1983 budget reflects a reasonable number of aircraft being requested to meet attrition and retirement needs for us in the Navy. These requirements equate to 324 aircraft per year, as shown on this slide.

COMMUNITY	ANNUAL ESTIMATED ATTRITION	ATTRITION PLUS RETIREMENTS PER YEAR
TACAIR		
● VF/VA	66	150
● ASW	2	8
● AEW	1	5
HELICOPTERS	23	75
PATROL	2	16
SUPPORT	3	16
TRAINING		
● JET	9	31
● PRO/HELO	4	14
LAMPS	4	9
TOTAL	114	324 (349)

CHART 1

ATTRITION RATES

They will increase to 349 as the current force of 12 carrier air wings increases to 15, to match the number of carriers that we are planning to deploy by the early 1990's.

The annual retirements, as depicted on the screen, are relatively straightforward, but the attrition rates are based on the historical data which we have derived from each aircraft community that is represented.

I would like to add that the current increased safety awareness and improved aircraft system maintenance have shown these projected attritions that are showing up there, like 114, to be higher than those that we actually experienced in the last several years. I hope that trend continues.

AIRCRAFT PROCUREMENT

	FY 82	FY 83
A6E	12	8
EA6B	6	6
AV8B	12	18
F-14	30	24
F/A-18	63	84
CH-53E	14	11
AH-1T	—	—
SH-60B	18	48
P-3C	12	6
E-2C	6	6
SH-2F	18	18
C-9B	—	—
C-2A	—	8
T-34C	60	30
F-5E	—	—
TH-57	30	21
EC-130Q	2	—
KC-130R	4	—
TOTAL	**287**	**288**
TOTAL APN	**$9.140B**	**$11.582B**

Chart 2

AIRCRAFT PROCUREMENT

As you can see, the fiscal year 1983 budget request funds 288 aircraft, still short of the average required, which was 324 or 349, but adequate in view of the fiscal realities we face in today's world.

While it procures essentially the same number of aircraft as the fiscal year 1982 budget, the 1983 budget reflects increased procurement of the F/A-18, the SH-60B, the AV-8B, with their relatively high, mostly nonrecurring. up-front investment costs in lieu of the large number of relatively inexpensive aircraft that we procured last year, or are procuring this year—trainer aircraft that we need badly in the Training Command.

I think it is important to point out that roughly one-third of the $11.6 billion requested is devoted to the three less visible but equally essential, efforts designed to maximize existing aircraft systems

FY-83 AIRCRAFT MODIFICATIONS

		$ MILLIONS
READINESS	– RELIABILITY/MAINTAINABILITY & SURVIVABILITY	671.2
CAPABILITY	– EFFECTIVENESS	466.4
FORCE LEVEL	– CONVERSION IN LIEU OF PROCUREMENT (CILOP) SERVICE LIFE EXTENSION PROGRAM (SLEP)	112.2
SAFETY		61.3
	TOTAL	1311.1

CHART 3

AIRCRAFT MODIFICATIONS PROGRAM

These are an aircraft modifications program for $1.311 billion, which modifies aircraft to extend their service life. It upgrades their capabilities. It improves their readiness and it corrects existing safety deficiencies. This is one of the most cost-efefective ways for us to keep abreast of the emerging threat and especially so when we are not able to procure the numbers necessary to maintain force levels.

FY 83 AIRCRAFT SPARES

	FY 83
● INITIAL SPARES	932.0
● REPLENISHMENT SPARES	1148.9
TOTAL	2080.9

CHART 4

AIRCRAFT SPARES PROGRAM

An aviation spares support program of $2.080 billion which reflects our determined effort to assure the sustainability of our weapon systems and to achieve the CNO's goal of a 70-percent mission capability. The present program is designed to correct previous spares deficiencies and prevent similar problems from occurring in the future.

For the first time in many years this account is considered funded at near the 100 percent level.

FY 83 AIRCRAFT SUPPORT EQUIPMENT AND FACILITIES

COMMON GROUND EQUIPMENT	415.2
AIRCRAFT INDUSTRIAL FACILITIES	24.4
WAR CONSUMABLES	9.3
OTHER PRODUCTION CHARGES	31.1
TOTAL	480.0

CHART 5

AIRCRAFT SUPPORT EQUIPMENT AND FACILITIES FUNDING

Finally, an aircraft support equipment and facilities funding line of $480 million that funds a wide variety of support, ranging from rework facilities to automatic test equipment. Without this solid base, our aircraft cannot operate to their full potential.

Mr. Chairman, the President's fiscal year 1983 budget continues a positive trend in aviation in terms of force level assurance. We still have a way to go, as is obvious by the budget request, but I am pleased to say that naval aviation, like the Navy on the whole, is on the move. We are significantly more capable today than we were 2 years ago.

[The prepared statement of Admiral McDonald follows:]

PREPARED STATEMENT OF VICE ADM. WESLEY L. McDONALD, USN

DEPUTY CHIEF OF NAVAL OPERATIONS

(AIR WARFARE)

Mr. Chairman and distinguished Members of the Committee:

I am indeed honored to appear again before this body to present naval aviation issues as they relate to the fiscal year 1983 procurement request. I am accompanied by Lieutenant General White, Marine Corps Chief of Staff for Aviation, and Vice Admiral Seymour, Commander Naval Air Systems Command.

I am grateful for the opportunity today to describe briefly the character and composition of the Navy-Marine Corps aviation teams, and the vital function of this budget request in maintaining the viability of that team. In this budget request, we have devoted much effort to strengthening Naval Aviation through a balanced approach to competing priorities. We have not proceeded with procurement as far in some areas as I would like, but I am satisfied that we have planned the distribution of this procurement in the most profitable manner to sustain our naval aviation force levels and effectiveness.

FORCE COMPOSITION

The FY-83 budget requests a complement of formidable aircraft in our airwings that ensures the achievement of control of the seas and projection of power ashore. I would like to describe a few of the programs in this procurement plan.

The A-6E INTRUDER is the all-weather attack aircraft for both the Navy and Marine Corps. This multi-capable, combat-proven aircraft provides both services with an aircraft of great flexibility and dependability. The funds requested for fiscal year 1983 permits the production of eight aircraft, and advance procurement for eight A-6Es in fiscal year 1984. Although a reduction from prior years' procurement of twelve aircraft, we can accept this two year reduction, created by affordability constraints, and still achieve our goal of 14 airwings by 1987.

One of our more important tactical aircraft fires no missiles and delivers no ordnance--but its presence in a defense suppression role is critical to the success and survivability of our strike aircraft. Of course, I refer to the EA-6B PROWLER. The PROWLER is the only combat-proven tactical electronics jammer aircraft currently in production. Its capabilities are impressive, and its indispensibility in combat is a matter of record.

The F-14A TOMCAT and its integral PHOENIX missiles is our premier fleet air defense aircraft. As impressive as its past performance has been, the TOMCAT still needs attention to keep it the best interceptor in the world. We are addressing these needs in a forthright and aggressive manner. The areas of concern in the F-14 are: the weapons system, the engine, and the requirement for increased force levels -- an important improvement to the weapon system programmed for introduction in the next few years is the replacement of the analog processor of the AWG-9 with a new digital, programmable signal processor, or PSP. The PSP will improve the radar's reliability and maintainability, reduce its susceptibility to jamming, provide the capability to identify targets at longer ranges, and improve long range target resolution -- the TF-30-414 engine has been a source of serious concern, both in terms of overall performance and significant reliability and maintainability deficiencies. Currently, there is an on-going component improvement program, designed to reduce the engine stall rate by 50 percent and improve the depot level rework interval and low-cycle fatigue life by a factor of two. In force level considerations, the Navy plans to transition the FORRESTAL airwing and the air wing embarked on subsequent carriers to the F-14 by the late 1980s. We have just completed transitioning the 15th and 16th Navy fighter squadrons from F-4s to F-14s and will transition the 17th and 18th squadron during this year.

The introduction of the F/A-18 HORNET into the fleet in FY-83 to replace the A-7s and the F-4s brings to the fleet an aircraft with a quantum improvement over current aircraft in terms of reliability and maintainability. Since the HORNET is fully fighter capable, it can augment the F-14 in the outer air battle if the threat levels dictate. This will provide the battle group commander an unprecedented level of flexibility with his embarked airwing aircraft that can prove absolutely vital in determining the outcome of a battle.

Airborne early warning, and the critical airborne command and control functions, are performed superbly by the E-2C HAWKEYE. The HAWKEYE is the evolutionary product of over twenty-five years of Navy experience in airborne control systems, and it remains for its type the world's criterion system. The HAWKEYE is a vital partner of the F-14 in the maritime air superiority environment, and it plays an essential role in the coordination of all airwing missions. This uniquely capable platform has both active and passive electronic systems, and it performs yeoman service as the eyes of the tactical commander.

The Battle Group's integral ASW capability resides in the S-3 VIKING aboard our carriers and our LAMPS helicopters aboard surface combatants. Complemented by the P-3C ORION with the UPDATE III modification in the outer-zone ASW role, I am confident that we are well on our way to achieving at least parity with the emerging submarine threat.

Finally, this budget ensures that our airwings will continue to be supported by KA-6 tankers, reconnaissance equipped aircraft, and replenished by our improved C-2A carrier-on-board delivery aircraft. Approval of the fiscal year 1983 budget will allow us to continue to put to sea a force capable of convincing potential adversaries that predictable loss from military action will far exceed any expected gains.

COSTS

Despite increased funding allocated to the defense budget, affordability will continue to be a crucial issue in improving Naval Aviation. A part of our overall affordability problem this year, as last, is the high initial capital investment necessary during the early years of the F/A-18 HORNET, the SH-60B, and now, the AV-8B HARRIER. For the time being, these high initial, and largely nonrecurring, costs produce a high production unit cost, but the benefits of economy of scale now are beginning to manifest themselves for the F/A-18 and should in later years for the AV-8B. We will, of necessity, continue to prioritize our allocation of funds and procure austere systems rather than the higher cost options that we might like to have. My most critical task will continue to be the funding of systems that offer the highest payoff while doing so within allocated fiscal ceilings. That requirement frequently leads to funding of upgrades of current aircraft rather than procurement of new systems. Upgrades that produce improved reliability and maintainability for better readiness, while yielding greater capability, will receive my highest priority.

One of the most cost effective methods of achieving more bang-for-the-buck is realized through our Aircraft Modification Program, funded in Budget Activity 5. When fiscal contraints preclude new aircraft procurement, it is even more essential that we continue to improve our weaponry through this program. In the fiscal 1983 budget, funds are requested for approximately 240 individual improvements to our aircraft. They are broadly categorized in force groupings:

- Readiness Modifications: improve reliability and maintainability, or correct deficiencies that make the aircraft difficult to support.
- Safety Modifications: correct design deficiencies that contribute to unsafe aircraft operations.
- Capability Modifications: upgrade the capability of the weapon systems to keep abreast of emerging threats.
- Force Level Modifications: fund Service Life Extension Program (SLEP) or Conversion-in-Lieu-of-Procurement (CILOP) efforts to help maintain the required number of aircraft in active service. While each of the programs falls in one or the other of these categories, virtually all have more than one of the above qualities inherent in them.

Another cost-effective effort is improved safety, which saves aircraft, and therefore, money, in a cost avoidance sense; but, more importantly, it saves the lives of highly skilled personnel. We have made great strides in safety recently and we are proud of the fact that 1981 was the safest year in recorded naval aviation history. For the first time the annual accident rate per 100,000 flight hours was below 5.0, finishing at 4.95. A comparison of 1981 with 1980 statistics reveals a 9 percent reduction in number of lives lost and a savings of 25 aircraft. Based on an average cost of $30 million per combat aircraft, this respresents a one-year cost avoidance savings in aircraft of approximately $750 million.

FORCE LEVELS

Last year, I stated that our current force structure was at an absolute minimum and that further inventory reductions would reduce our ability to conduct operations at sea. The actions of the Congress, and this committee, on that request, were indeed instrumental in turning this perception of concern into one of optimism. The fiscal year 1982 budget request represented a significant breakthrough with the procurement of 287 aircraft. You must recognize, however, that the FY-82 request was heavily weighted with less expensive training aircraft but were badly needed to increase our lagging pilot training inventory. The budget before you today, reflecting a request for 288 aircraft, represents a minimal increase from last year, but it does include increased procurement of front-line aircraft such as the AV-8B, F/A-18 and SH-60B with their high initial investment costs. While this procurement level is still short of the 324 aircraft we need to a maintain our current airwings and force levels, and well short of the 349 we estimate will be required for 15 carrier battle groups, I feel we are continuing to make progress toward our future force level goals. The budget before you reflects naval aviation on the way back from the severe deficit it faced in previous years.

It appears appropriate at this juncture to explain how we have arrived at our requirement for the procurement of approximately 330 aircraft per year. This exhibit displays, by community, the long term average annual inventory reductions that we project each year in the course of operating the present forces comprised of twelve carrier airwings, three Marine airwings, the current land based patrol force, and the associated support, training and Reserve forces.

ANNUAL LOSSES

COMMUNITY	ESTIMATED ATTRITION	ESTIMATED RETIREMENTS	TOTAL
TACAIR			
o VF/VA	66	84	150
o ASW	2	6	8
o AEW	1	4	5
HELICOPTERS	23	52	75
PATROL	2	14	16
SUPPORT	3	13	16
TRAINING			
o JET	9	22	31
o PROP/HELO	4	10	14
LAMPS	4	5	9
TOTAL	114	210	324*

* This total is based on 12 carrier airwings and will incrementally increase to 349 as the force grows to 15 carrier airwings in the 1990s.

I want to emphasize that these numbers represent approximate long term averages. Year by year, attrition and retirement estimates, which reflect our most current historical data and planning factors, will vary from the long term average.

RDT&E

The foregoing presents our near term procurement needs; I would like now to address four major R&D issues that are important to the future of naval aviation.

First, Navy Undergraduate Jet Flight Training System (VTXTS) is an integrated training system consisting of aircraft, simulators, academics, a training management system, and the associated support systems and equipment. VTXTS is needed as a replacement training system in the intermediate and advanced jet pipeline of the Naval Air Training Command where the T-2C and

TA-4J are currently used. Both the T-2C and TA-4J are out of production, inefficient to operate and maintain, and will not provide the comprehensive training required by the fleet in the 1990s. Existing inventories of T-2C and TA-4J aircraft are inadequate to sustain fleet support needs and training requirements in the late 1980s as training rates are increased to man additional Battle Groups. Positive action must be taken now to be able to introduce VTXTS as early as possible to take advantage of substantial operating and maintenance cost savings, improve training effectiveness, and avoid adverse affects on the pilot training rate due to insufficient trainer assets.

Second, the introduction of V/STOL aircraft still remains attractive if by doing so we can reduce carrier vulnerability while at the same time increasing operational flexibility and maintaining mission effectiveness. I urge your full support for the FY-83 V/STOL program which includes plans for an Augmented Deflected Exhaust Nozzle (ADEN) technology demonstration using an A-6 airframe.

Third, I am pleased to be able to report to you that the Navy has a firm commitment to join with the Army and Air Force in a joint development project for an Advanced Vertical Lift Aircraft (JVX) which could meet the Marines' HXM requirement for a medium weight class assault transport aircraft of the 1990s. The Army will be lead service and the project's goal is to build a common vehicle which all services can use in various mission roles. Our immediate, primary uses are for the Marines Corps assault transport and for Navy Combat SAR, but we will also be actively exploring other naval mission applications for JVX.

The last major R&D issue relates to TACAMO, our Specialized Communications System which has been operational for seventeen years. The mission has taxed the currently assigned EC-130 aircraft to exhaustion by operating them in excess of their weight limits and at a very high utilization rate. With the TACAMO mission requirements expanding in the late 1980s, it is clear that the EC-130s will not at that time be able to give us an adequate capability to cover this vital national defense Ballistic Missile Submarine Communications requirement. We are, therefore, requesting R&D funds for ECX, a TACAMO prototype aircraft.

In concluding, I believe that our naval air forces today are extremely capable and will hold their own against any threat in carrying out their mission. While improved force effectiveness and adequate numbers of aircraft are essential to achieving maritime superiority, readiness remains the vital key. Our aircraft and weapons systems must be available--that means spare parts, repair capabilities and built-in reliability on the order of the F/A-18, and continued modifications to existing systems that increase their reliability and enhance their maintainability.

I echo the CNO's words in his posture statement when he said, "The future of Naval Aviation is bright and we should continue to dominate the air over the seas for the remainder of the decade and beyond." I totally support that view, but with it lies the implied responsibility of sustaining our efforts to provide the necessary cohesive links that will permit carrier battle groups and naval aviation as a whole to retain their unchallangeable position on the seas of the world. Naval Aviation, like the Navy as a whole is on the move. I am convinced that we are significantly more capable today than we were two years ago.

BIOGRAPHICAL SKETCH

VICE ADMIRAL WESLEY L. McDONALD, USN

Vice Admiral Wesley L. McDONALD, of Arlington, Virginia, is a carrier aviator who has served in various staff and command positions since he graduated from the U.S. Naval Academy in 1946. His formal education includes Randall's Preparatory School (Washington, DC), U.S. Naval Academy (BS) and George Washington University (MS).

Prior to entering flight training in 1948, Ensign McDONALD was a member of Admiral Richard E. BYRD's South Pole Expedition "HIGH JUMP." After receiving his wings, the Admiral served in several carrier jet fighter and light attack squadrons.

Command tours of duty include Attack Squadron FIFTY SIX, Carrier Air Wing FIFTEEN, amphibious landing ship dock USS HERMITAGE, and the aircraft carrier USS CORAL SEA. While in command of Coral Sea, he was selected for promotion to Rear Admiral and assigned duty as Commandant, Thirteenth Naval District. In 1972 he assumed command of Carrier Group THREE and deployed to the Western Pacific. This assignment in the Western Pacific was continued when Rear Admiral McDONALD was assigned as Commander Naval Air Force Pacific's representative embarked in USS MIDWAY, homeporting in Yokosuka, Japan. He then served as the Chief of Naval Air Training for one year before being reassigned to Washington in August 1975 for duty as the Deputy, Chief of Naval Personnel.

Vice Admiral McDONALD was promoted to his present rank and assumed command of the Second Fleet in July 1977 with responsibilities for planning and directing operations to gain and maintain control of sea areas as required to defend the United States, U.S. possessions, and island bases.

Vice Admiral McDONALD assumed his present position as Deputy Chief of Naval Operations (Air Warfare) in July 1979, with responsibilities for establishing policy for the conduct of naval air warfare and determining plans and requirements for naval aircraft, air weapons systems, aircraft carriers, and specified aviation type ships. He is the principal advisor to the Chief of Naval Operations for all matters involving naval aviation.

Personal decorations include the Distinguished Service Medal, Legion of Merit (2), Distinguished Flying Cross (2), Bronze Star, Defense Meritorious Service Medal, Meritorious Service Medal, four Air Medals, Joint Service Commendation Medal, and the Navy Commendation Medal.

Married to the former Norma Joy of Arlington, Virginia the McDONALD's have four children and reside at Quarters "V" in the Washington Navy Yard.

Admiral **McDonald**. At this point I would like to stop my oral remarks and defer to General White.

Senator **Andrews**. General White.

RESUMED STATEMENT OF LT. GEN. WILLIAM J. WHITE, USMC

AV-8B HARRIER

General **White**. Mr. Chairman and distinguished members of the committee, I am pleased to have this opportunity again to address the committee on the important Marine Aviation programs.

The first of these and by far the most important in terms of our priority is the AV-8B Harrier.

Vugraph. 1

AV-8A/AV-8B COMPARISON

This photograph shows the new AV-8B. In the background you have the old AV-8A which the British are operating. This aricraft continues to be the cornerstone of the Marine Corps' modernization of our light attack force.

The AV-8B is a brand new design based on technology proven by the old British AV-8A. As far as performance goes, the "B" has twice the payload or twice the range over the old AV-8A.

Senator **Rudman**. Can you give us some of those numbers, General White?

General **White**. Let me try: With a 1,000-foot takeoff, it has a combat radius of [deleted] miles, with a bombload that contains [deleted] mark 82 1,000 pound bombs.

With that kind of performance, you put the AV-8B certainly in the A-4 class, perhaps in the class with the A-7. You have in the AV-8B an aircraft that can perform as far as range is concerned with modern attack aircraft, but you have the bonus effect of a STOL or V/STOL takeoff.

Senator **Rudman**. And its approximate speed?

General **White**. It is a subsonic aircraft; it is not supersonic. You are talking about a tactical speed of [deleted] or [deleted] knots.

Senator **Andrews**. Your get your range by increasing your takeoff length to 1,000 feet?

General **White**. That is correct.

Senator **Andrews**. That same bird can take off vertically with a lot less load?

General **White**. That is the reason I said either twice the range or twice the payload; it is a tradeoff between fuel and payload.

Senator **Andrews**. What is the range of the vertical takeoff?

General **White**. Let me ask the program manager that question. Colonel Orr?

Colonel **Orr**. On a hot day, 90° F. day—we will provide as elaborate an answer as the Chairman desires for the record—on a 90° F. day, vertical takeoff, [deleted] pounds of ordnance, about 50-miles radius. The airplane was optimized for the short takeoff rather than the vertical.

Senator **Andrews**. Proceed.

VUGRAPH 2

BASING FLEXIBILITY

General WHITE. I would like to turn now to basing flexibility.

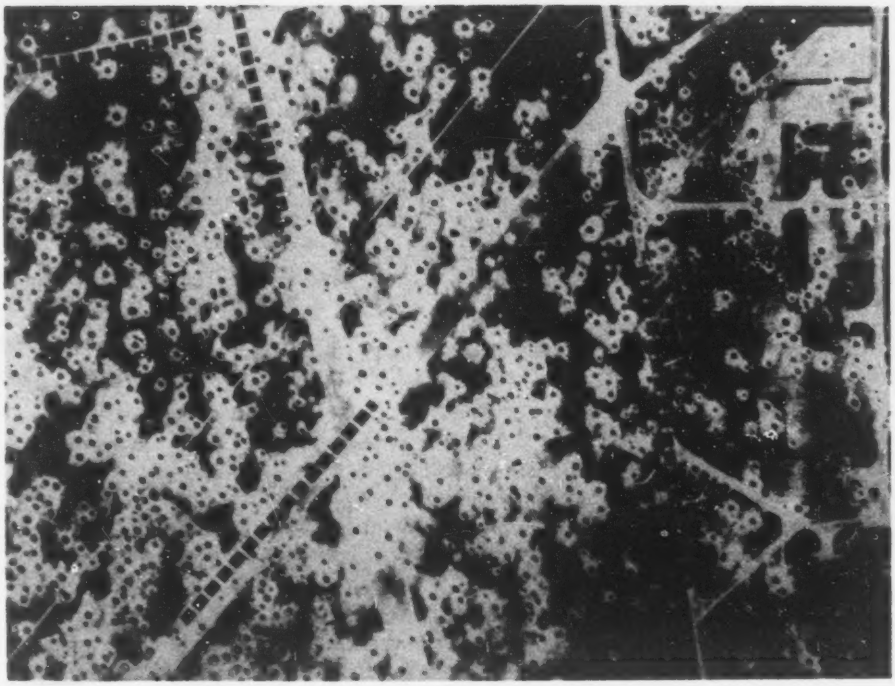
I think you understand that on land we can literally operate this aircraft from pastures, from dirt roads, parking lots, as you can see from this Vugraph.

VUGRAPH 3

AV-8 OPERATIONAL CAPABILITY

At sea we can operate this aircraft anyplace from a big-deck aircraft carrier down to the smallest ships that have helicopter platform. This means this aircraft can go anyplace our infantry battalions can go, basing this aircraft a few miles to the rear beyond artillery range where it will be ready to respond to the command of the ground commander in a short period of time.

This basing flexibility means something else that is equally important; it means the Marine Corps will be free of the tyranny of 10,000 feet of concrete runway which is so difficult and time-consuming to construct, but so easy to put out of action, as we have seen in the Falkland Islands, with a few well-placed bombs.

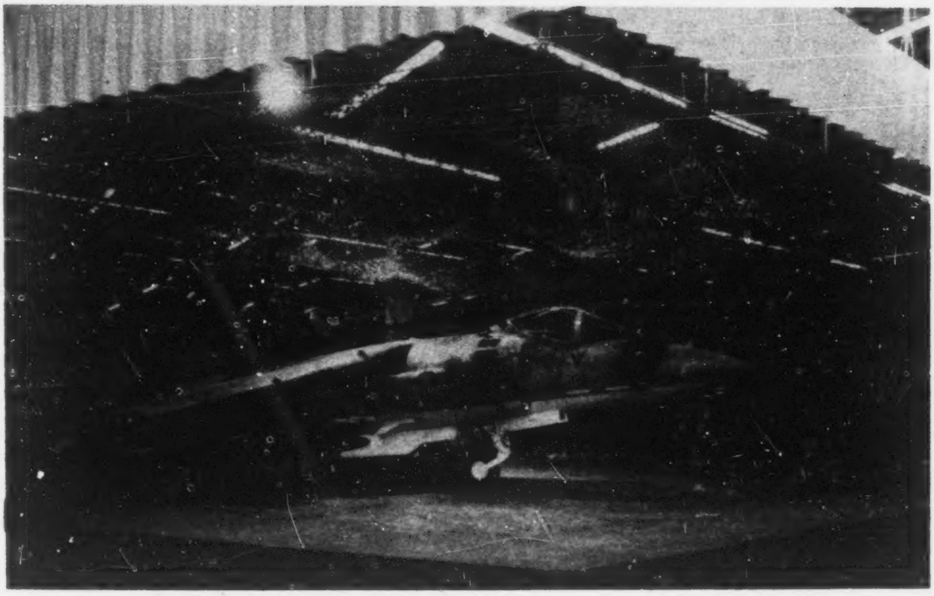


VUGRAPH 4

HARRIER PROGRAM STATUS

You are looking at a picture of a runway cratered during the Indo-Pakistani war.

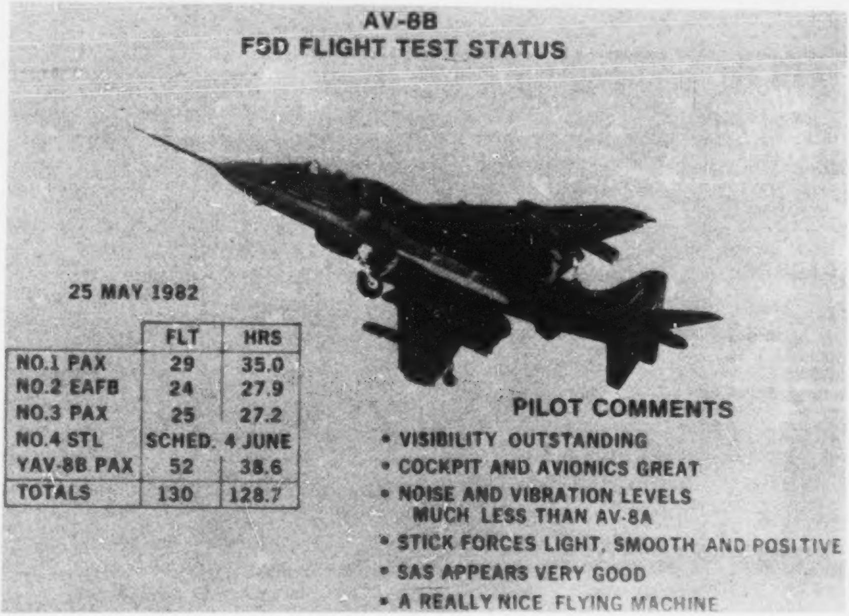
I would like to say where we stand on this program: I am pleased to report to the committee that our Harrier program is basically on schedule and on cost. Since last year, four full-scale development aircraft have been built from the keel up at McDonnell Douglas in St. Louis.



VUGRAPH 5

AV–8B ROLLOUT

This Vugraph shows the rollout ceremony in St. Louis last October with the first AV-8B. The first flight occurred on November 5, 1981 on schedule. Today these aircraft are undergoing initial testing at Edwards Air Force Base, Calif.; and at Patuxent River, Md.



AV-8B
FSD FLIGHT TEST STATUS

25 MAY 1982

	FLT	HRS
NO.1 PAX	29	35.0
NO.2 EAFB	24	27.9
NO.3 PAX	25	27.2
NO.4 STL	SCHED.	4 JUNE
YAV-8B PAX	52	38.6
TOTALS	130	128.7

PILOT COMMENTS

- VISIBILITY OUTSTANDING
- COCKPIT AND AVIONICS GREAT
- NOISE AND VIBRATION LEVELS MUCH LESS THAN AV-8A
- STICK FORCES LIGHT, SMOOTH AND POSITIVE
- SAS APPEARS VERY GOOD
- A REALLY NICE FLYING MACHINE

VUGRAPH 6

FLIGHT TEST STATUS

As you can see, at this point we have accumulated about 128 flight hours.

We have talked about safety very briefly. I will summarize that by saying we have paid close attention to our difficulties and we do admit to a high accident rate in the AV-8A. We think we are going to get it under control. We have designed out of the new AV-8B those safety problems both from the standpoint of pilot workload and engine reliability.

We do have two major areas of concern that I would like to discuss:

VUGRAPH 7

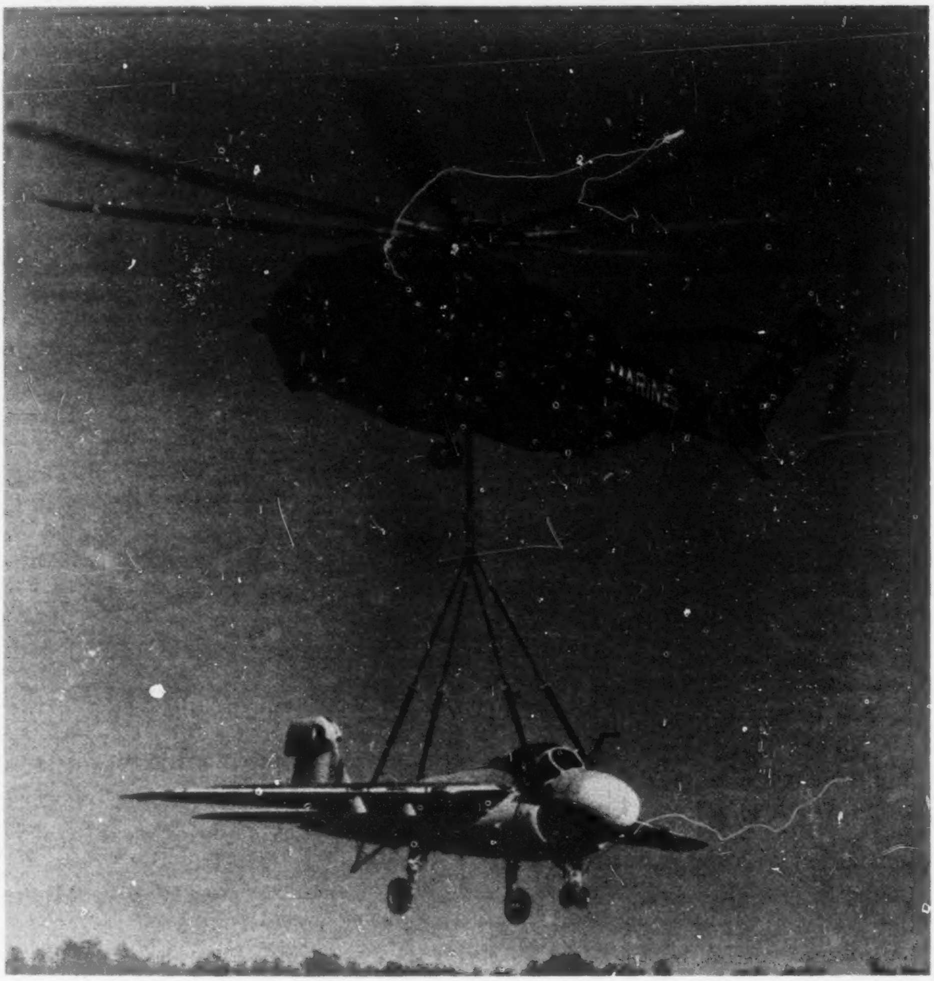
TWO-SEATER AV-8B

First, we believe it is essential that we get started now with the development of a two-seat version of the AV-8B in order to meet our vastly, expanded V/STOL training requirements in 1986 and beyone. During that time we will have to transition a large number of conventional pilots who are now flying our A-4M attack aircraft into V/STOL and AV-8B, and they need the support of the two-seat trainer. It is also important for me to note that we fully intend to fund the development of this two seater AV-8B, the procurement cost and development, from within the total 336 aircraft program, which means we are prepared to trade single-seaters for two-seaters. These two-seaters will be combat capable aircraft.

A second area of concern is that we must achieve an economic procurement rate. Unless we reverse the current stretchout trend and establish procurement economies of scale, the AV-8B unit cost will become excessively high.

Before I leave the AV-8B and go on to some other programs, I would be remiss if I did not again express my appreciation and that of the Commandant for the support we have received from the Congress over the years on this unique Marine Corps program.

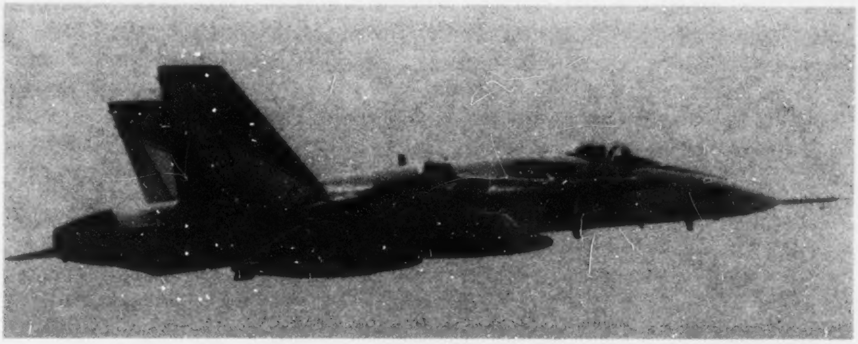
Now, Mr. Chairman, with respect to some other critically important Marine Corps programs, I am pleased to report we have made significant progress since last year. Since our last hearing, we have been able to place new aircraft system into the hands of our Marine Corps units. By all indications, these new aircraft are working exceedingly well.



VUGRAPH 8

CH–53E SIKORSKY SUPER STALLION

To illustrate this point, I would like to touch on a few of them, starting first with the CH–53E Super Stallion built by Sikorsky. Our first CH–53E squadron at New River has 15 aircraft and will be fully operational in June. Our second squadron now has 10 aircraft and should be operational in October, so we are making good progress. I am getting positive reports from both the maintainers and pilots. The 53E program is well on its way to success.



VUGRAPH 9

M'DONNELL DOUGLAS F/A-18

The next aircraft in order of arrival in our fleet marine force is the F/A-18, built by McDonnell Douglas. There is also substantial progress in the F/A-18 program. Modernization of our Marine Corps fighter attack force will begin in July when our first squadron goes to Lemoore for transitional training and will be back at Christmas with the first 12 aircraft.

This squadron will be the first operational squadron equipped with the F/A-18. The reports I am getting from both the Navy and the Marine Corps pilots underscore the belief we have had that the F/A-18 will set the standard of excellence in fighter attack aircraft for many years to come. It is not just the fighter pilots, but the maintenance NCO's, petty officers, the men with the wrenches are all delighted to see an aircraft that requires just about one-half the maintenance effort of the old F-4.

This is welcome news indeed to both the Marine Corps and all of naval aviation.

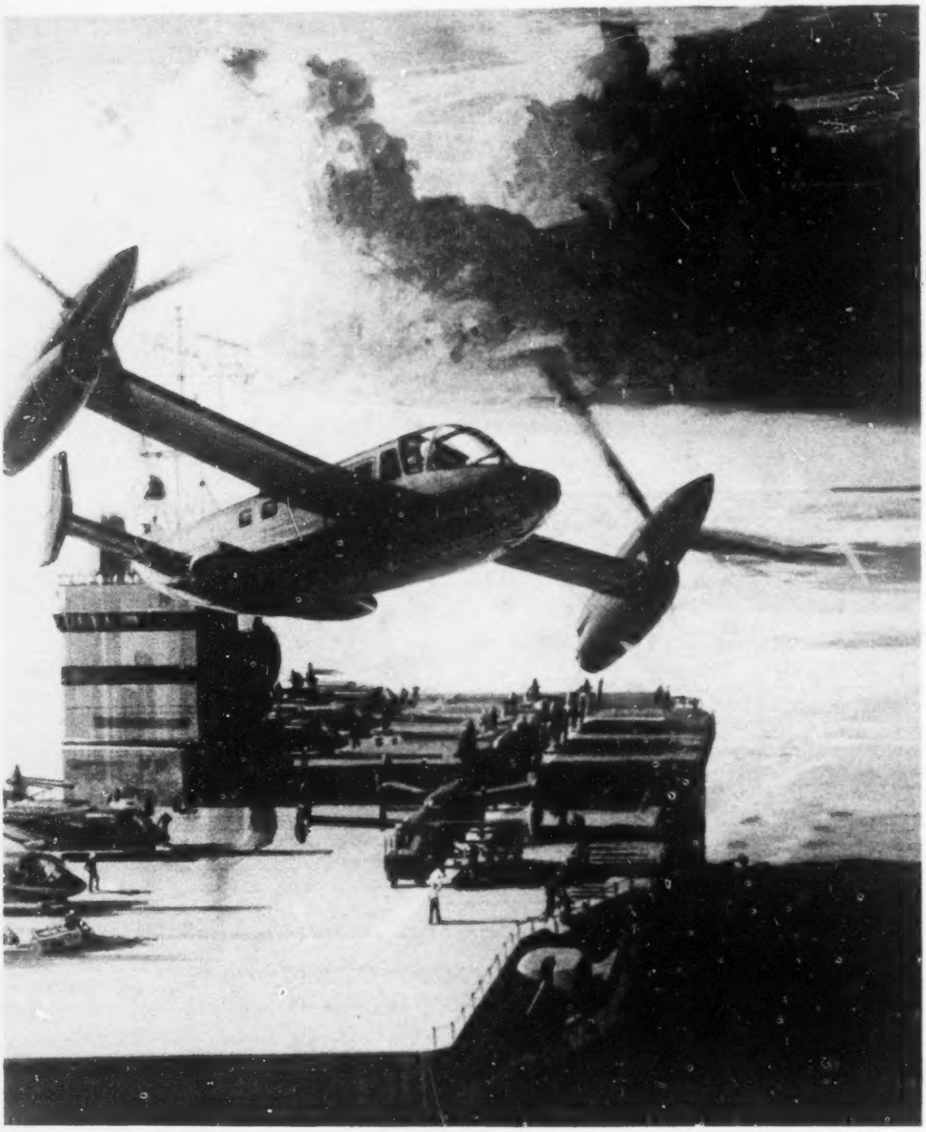
So far, I have just discussed only mature, ongoing programs. I would like to outline for you a very important helicopter modernization effort which is just now entering its formative stages.

For several years the Marine Corps has been seeking a suitable replacement for its aging fleet of CH-53A's and D aircraft, the older CH-53's and our CH-46 medium lift helicopter. Replacement has become a critical issue because, first, we have an inventory shortfall which limits our ability to conduct amphibious operations. Each year, normal attrition takes its toll.

Second, these helicopters due to their age, are experiencing an increasing cost of ownership; they are becoming difficult and expensive to maintain.

Finally, in our opinion, they lack the survivability and performance that we believe are necessary on a modern battlefield.

For these reasons, the Commandant has made their replacement Marine aviation's No. 1 priority in the research and development program.



VUGRAPH 10

ADVANCED ROTOCRAFT

What you see on the screen is an artist's conception of what an advanced rotorcraft might look like. You happen to be looking at the tiltrotor configuration, but there are others to pick from. A joint-service program, or JVX, has been formed by the Army, Navy, and Air Force. Cost sharing among the services for this program has been agreed upon. Also, a joint technical assessment has been conducted which indicates that the aircraft is technically feasible at moderate risk.

The fiscal year 1983 budget, the budget you are considering, contains the Army and Navy requests for program startup, and the fiscal year 1984 budget will contain substantial commitments from all the services on this program. We believe the JVX program represents a dramatic technological breakthrough and promises to significantly modernize and improve the Marine Corps combat capability.

That concludes my remarks. I will be glad to respond to any questions.

[The prepared statement of General White follows:]

PREPARED STATEMENT OF GEN. W. J. WHITE

DEPUTY CHIEF OF STAFF FOR AVIATION

U. S. MARINE CORPS

Mr. Chairman, Distinguished Members of the Committee:

It is a privilege to once again address the committee on the state of Marine Aviation. During the past year, thanks to the committee's strong support, we have made significant progress toward increasing our combat capability. We are beginning to place new weapons systems in the hands of our Marines in the field, and, by all indications, these systems are working exceedingly well. At this time, I would like to discuss several aviation programs of particular importance to the Marine Corps.

From the standpoint of procurement, The Marine Corps' highest priority aviation program continues to be the AV-8B Harrier. We are enthusiastically committed to this unique VSTOL aircraft due to its remarkable basing flexibility, close air support (CAS) responsiveness and superior reliability/maintainability. It is the first aircraft to be designed from the "keel up" to support the Marine Corps' CAS mission. It will carry a wide variety of modern weapons ranging from conventional and Laser Guided Bombs to Precision Guided Munitions (PGM). It will also be capable of defending itself by use of its Sidewinder Missiles, backed up by its 25MM Gatling gun.

We are also very pleased with the many new safety features which have been included in the AV-8B. Profiting from our 11 years of experience with the AV-8A, the original British built Harrier, we have designed the AV-8A's safety shortcomings out of the AV-8B. For example, in the cockpit, the pilot has far better room and visibility. The pilot's workload has been reduced by at least 65% through the incorporation of Hands On Throttle and Stick (HOTAS) controls and a new Stability Augmentation Attitude Hold System (SAAHS). These features are reinforced by a super critical wing which provides positive stability while transitioning to and from V/STOL flight and this in turn provides the pilot with increased control authority. These features all combine to virtually eliminate V/STOL instability in the AV-8B. the AV-8B's new F406 engine also represents a substantial safety improvement. Using in service performance data gained from the AV-8A's F402 engine, the AV-8B's engine has been redesigned to provide significantly greater reliability and maintainability. In testing conducted thus far, F406 engine components have demonstrated a much higher mean time between failure rate than the F402 engine. Additionally, the F406 has required fewer maintenance manhours per flight hour.

During the past year, four Full Scale Development (FSD) aircraft have been completed. The first FSD test flight took place, according to schedule, on November 5, 1981, and additional flights are being conducted on a daily basis. All test flights have been highly successful and are verifying the design and performance improvements built into the AV-8B. The test pilots have found that the AV-8B has actually far exceeded the performance and handling characteristics we had expected. These FSD aircraft are currently at the Naval Air Test Center (NATC) Patuxent River, Maryland, and the Air Force Flight Test Center at Edwards Air Force Base, California undergoing initial testing. Operational Evaluation (OPEVAL) is scheduled for August 1983. The success, thus far, of the AV-8B program in meeting its planned milestones gives us great confidence that our planned IOC of 1985 will be met on schedule.

As we continue forward, there are two areas of the AV-8B program which require carefully monitoring. First, total program cost is of major concern. Through careful management, this program has remained basically on time and on cost and we certainly intent to see that situation continue. It should be noted, however, that the AV-8B is more sensitive to fluctuations in procurement quantities than other Department of the Navy aircraft programs, which means that any premature program stretch-out will increase total program cost due to inflation and loss of economy of scale. Second, we have studied the training requirements which will be generated by the transition of large numbers of our A-4M pilots into the AV-8B commencing in FY-86. This major training effort will clearly require the support of a two seat training aircraft in FY-86 to safely handle the large numbers of pilots who must be transitioned from a Conventional Take Off and Landing (CTOL) to a V/STOL aircraft. This problem is currently being jointly addressed by the Navy and Marine staffs and we are confident that an acceptable solution to this problem will be forthcoming in the near future.

In the area of research and development, Marine Aviation's number one priority is the establishment of a program leading to a replacement for our aging helicopter force of CH-46E and CH-53A/D aircraft. These helicopters suffer from several problems which make planning for their timely replacement a critical necessity. First, we have an inventory shortage which limits our ability to meet our current medium lift requirements. Second, these helicopters, due to their age, have an ever increasing cost of ownership. Third, they lack the survivability and maintainability of current generation aircraft. Finally, the more demanding future lift requirements of the Marine Amphibious Force require a more capable assault transport aircraft. For these reasons, solutions to our assault vertical lift deficiency must be undertaken without further delay. The Marine Corps is pursuing this solution by two approaches. First, we are participating in the establishment of a joint service program designed to produce an advanced vertical lift aircraft, designated JVX, by the early 1990s. A variation of this aircraft has the clear potential of fulfilling the Marine Corps' medium assault transport requirements. Second, we are planning procurement of an off-the-shelf helicopter as a means of providing a suitable interim remedy to our medium lift shortfall until the advanced vertical lift aircraft becomes a reality. Funding requested in FY-83 will enable us to proceed with the JVX program while funding for our off-the-shelf helicopters will be addressed in the FY-84 budget.

Thanks to substantial progress in the F/A-18 Hornet program modernization of our Marine fighter-attack (VMFA) force will actually begin in July when VMFA-314 proceeds to NAS Lemoore, California for six months of F/A-18 transition training with VFA-125, our joint Navy-Marine F/A-18 training squadron. VMFA-314 will return to MCAS El Toro, California, in January 1983, where it will receive its full complement of 12 F/A-18s. The squadron will be joined by two other squadrons, VMFA-323 standing up in October 1982 and VMFA-531 in January 1983. This will enable the Marine Corps to field the first three operational F/A-18 squadrons by the end of FY83. The Navy and Marine Corps have agreed to develop a capability to deploy two Marine Corps F/A-18 squadrons by January, 1984, should the operational need arise. This capability will be attained just 12 months after the first operational F/A-18 squadron has completed initial training, and we believe it to be a major logistic as well as operational milestone.

In spite of all the good news about the F/A-18, we do have one area of concern: RDT&E funding. In FY-82, we note a $35 million shortfall which will cause delays and reductions in the air to ground attack capability test program at Patuxent River. In the long term, we are confident that the testing will be completed, and the Hornet will achieve its full potential as an attack aircraft. In the short term, however, delays in FY-82 testing will result in aircraft being delivered to Marine fighter/attack squadrons in 1983 with less than desired attack capability.

Another new aircraft which is now proving its worth every day in the Fleet Marine Force is the CH-53E Super Stallion. Our first CH-53E squadron, HMH-464 is now operating from MCAS(H) New River, North Carolina, with its full complement of 15 aircraft. Our second 53E squadron was activated in December 1981 at MCAS(H)

Tustin, California, and received its first two aircraft in February and March 1982. By all accounts, the CH-53E is a bona fide operational success. Reports from HMH-464 pilots indicate that the performance of the CH-53E is exceeding our original expectations. Since receiving its first aircraft in June 1981, the squadron has routinely lifted 14.5 ton practice loads and has demonstrated the 16 ton lift capability while supporting our ground Marine units at Camp Lejeune, North Carolina. The 11 CH-53Es requested in FY-83 will be used to begin outfitting our third CH-53E squadron which we plan to establish in FY-85. These first three squadrons will minimally meet our current heavy lift requirements for the ship to shore movement of the M-198 Howitzer (8 tons) and its prime mover (12.5 tons). With the introduction of the LAV (14.5 tons) into the Fleet Marine Force in large numbers, total heavy lift requirements for the ship to shore and subsequent operations ashore missions will more than double the number of CH-53E squadrons required.

Another important helicopter program addressed in the FY-83 budget is the AH-1T Cobra. The budget requests $17.2 million in long lead procurement funds for what is essentially an off-the-shelf purchase of 22 AH-1Ts in FY-84. These attack helicopters plus an additional 22 planned for procurement in FY-85, are needed to rectify a severe attack helicopter deficiency in both our active and reserve Marine Aircraft Wings. The AH-1Ts being procured will be capable of firing the Sidewinder missile as well as anti-tank weapons which will give them a potent new air-to-air capability as well as a much enhanced anti-tank capability. Both of these added capabilities are clearly needed to counter the serious threat posed by the Soviet Hind-D helicopter and Soviet tank deployment.

The magnitude of the Soviet tank threat requires Marine Aviation to focus its attention on Precision Guided Missiles (PGM) which can successfully engage enemy armor at standoff distances. We believe the Hellfire and Laser Maverick are two such PGMs which can take on the threat and beat it without suffering unacceptable aircraft attrition.

Hellfire is being procured for eventual use by our attack helicopter force. The great tactical advantage of the Army developed Hellfire missile over the TOW is in the survivability it offers the attacking aircraft. Our pilots will be able to fire the laser guided Hellfire at a tank, which is laser designated by the ground commander, and then break away before entering the tank's anti-aircraft killing zone. Our AH-1/Hellfire IOC of FY86 will provide the ground commander with much needed additional tank killing punch.

On the fixed wing side of Marine Aviation, Laser Maverick promises to offer the same type of aircraft survivability to our AV-8B, F/A-18, A-6E, and A-4M aircraft that the Hellfire will provide to the attack helicopters. With its unique 300 pound warhead, it also offers tremendous target lethality against tanks and other hard targets. Even a near miss from this weapon will provide mobility and firepower kills against the heaviest Soviet armor. Results from our operation testing of Laser Maverick give every indication that the missile's planned IOC of FY-85 is solidly achievable.

In addressing the preceding weapons systems, I have forecast substantial modernization for our active structure, however, I should emphasize that this modernization also provides an important opportunity for us to upgrade the Marine Corps' reserve aircraft wing. For example, the introduction of new AH-1Ts into the active structure will free AH-1J helicopters to migrate into the Reserve component. The AV-8B will provide the same benefit by releasing A-4Ms equipped with the Angle Rate Bombing System (ARBS) to the Reserves. The transition to the F/A-18 will have the same effect by providing the F-4S for the Reserve fighter squadrons. Thus, as we improve the capabilities of our active Marine Aircraft Wings, we improve our Reserves as well and the dividends we receive are doubled.

This concludes my formal remarks. At this time, I am ready to answer any questions you may wish to ask.

F/A-18 COSTS

Senator **Andrews**. Between September and December 1981 the estimate of the total cost of the F/A-18 program increased by $4 billion, from $35.3 billion to $39.7 billion, for the same number of aircraft, 1,377. We are now to $10 billion over the Navy's September 1980 estimate. What explains these increases?

Admiral **McDonald**. Mr. Chairman, the program has not increased as far as the numbers you cited, for the 1,366 operational aircraft and 11 test airplanes, a total of 1,377.

The major cause of the increase has been in the inflation that we have seen and have been unable to explain. However, to give you a fuller explanation of all the cost considerations, I would like to call on Commodore Weaver to speak to the program stretchout. As General White said, one of the factors is price escalation due to inflation. Program stretchout and other points account for the rest.

Senator **Andrews**. What the committee would like is how much of this increase of $4 billion is due to inflation and how much of it is due to program stretchout.

Admiral **McDonald**. $2.9 billion is in inflation; $1.2 billion is in program stretchout; however, I will let Commodore Weaver definitize those.

Commodore **Weaver**. Those figures are accurate, Admiral. The remaining $250 million is associated with the increased cost of spares and support for the additional air wings that we are projecting to buy, plus the additional spares—actually, the stretchout you saw on the program in the revised FYDP, some 124 aircraft moved in the outyears. That increased the cost.

The variation due to the allowed OMB inflation rate is $2.9 billion. The program previously was at $37.8 billion. When the escalation rates were reduced it went down to about $34 billion. Primarily as a result of that increased inflation rate, and for the reason the admiral indicated, it went back up to $39 billion.

FULL-SCALE DEVELOPMENT PROGRAM

Senator **Andrews**. What are the results of full scale development test programs scheduled to be completed last month?

Commodore **Weaver**. The full-scale development program is completed. We completed it with a Navy TECHEVAL, which was conducted in the March timeframe. During that TECHEVAL we had 63 aircraft landings and catapult shots aboard the carrier. Those catapults were hands off. Of those 63 landings, they were both in a coupled and uncoupled mode, and were very, very successful. We did four automatic carrier landings to touchdown. Those were completely hands off; 19 of those landings were at night.

We explored the attack capability of the airplane. It has now operated in the operational evaluation. Pilots who are now flying it have expressed pleasure over the airplane.

Senator **Andrews**. Contrary to original plans, the number of F/A-18's to be procured was not reduced when the decision was made to move forward with procurement of over 300 AV-8B aircraft for the Marine Corps. Where are these additional aircraft going? Is this a windfall that led to the decision to initiate reduction of the F/A-18 in the Navy Reserve squadrons?

Admiral **McDonald**. No, sir, the decision to go with the AV-8B was almost taking place at the same time we were looking at increasing the size of the Navy to the 600-ship Navy that the CNO and the Secretary were postulating, as well as building that around the 15-carrier battle groups. That, to us, posed a requirement to build three carrier airwings at the same time. Those carrier airwings should have assimulated two light attack squadrons of F/A-18's in each of those, so you would have increased the total number by six squadrons.

We then looked at buying for attrition out to a later timeframe. The production was initially perceived to end in the mid-1990's. We stretched it out to the late 1990's.

We looked at the requirement that might be coming down the road for updating the capabilities of the Reserve Forces and articulated that fact so that you would have, on a continuing basis, a number that we could equate from the previous year without going back to explain to you why the cost dropped for a lesser base. If not, we knew that as we started to bring in those and other requirements it would drive that cost back up again, because the base had never remained solid.

It really was not an accounting accommodation in the truest sense of the word; yet, with the oncoming requirements that were immediately perceivable to us, we fixed the base to make it more readily explainable to you relative to the cost growth that you are concerned about here today.

F/A-18 ENGINE

Senator **Andrews**. How much of your engine component improvement program is going on in the TF-30 414 engine, and what is its——

Commodore **Weaver**. A significant amount of our engine component improvement program is going into the TF-30 414. It is buying for you, we hope, a significant improvement in that particular engine, where we hope to improve the depot interval on the engine from 1,100 hours to 2,200 hours. We also hope to improve the low cycle fatigue life of the engine rotors from 2,200 hours to 4,400 hours and reduce the stall rate in the fleet significantly.

We also are trying to, and have achieved, certain other reliability and maintainability upgrades in the engine.

The component improvement program did not meet the objective ills of the TF-30 at the present time. Pratt & Whitney is still working very hard trying to solve some of these problems and we think they are making some progress.

Senator **Andrews**. Do you get a warranty with that engine?

Admiral **McDonald**. I would defer to Admiral Seymore.

Senator **Andrews**. We talked engines and warranties the day before yesterday.

Admiral **Seymour**. I don't believe we have an expanded warranty.

Senator **Andrews**. Did you ask for one?

Admiral **Seymour**. We have discussed it with them. I don't recall specifically whether we asked or they offered.

F-14 ENGINE

Senator **Andrews**. What are your prospective buying numbers on this engine; how many are you going to get?

Admiral **Seymour**. In the aircraft modification activity, we are buying kits to modify the current F-14's we have.

In the procurement account we will be buying the TF-30's for the F-14, two for each F-14A we build.

Senator **Andrews**. What is the total number; how many engines are you going to procure?

Admiral **McDonald**. The planned procurement was to terminate at 509 aircraft, which would provide us with 18 squadrons of F-14's. We changed our planning to have F-14's aboard each big-deck carrier, two squadrons each, which drove that number up to 845 F-14's. So, there is an increase of 336 additional aircraft. That would drive you to 772 additional engines, not counting spares, sir.

Senator **Andrews**. The point is, with 800 planes, twin-engine planes, the answer to my original question could have been 1,600 plus engines you are contemplating buying; is that right?

Admiral **McDonald**. Not quite, sir. We have already bought the 1,000-plus engines to go into those airplanes that are in the program thus far.

Senator **Andrews**. They are the original TF-30 414. Now you are going to a modification of this?

Admiral **McDonald**. No, sir. The original engine was a 412 engine which was then upgraded to improve the reliability and maintainabilty of the engine to what we call the 414. The Component Improvement program produces the 414A.

Senator **Andrews**. You are putting the 414A in the new bird coming off the line, of which there some 300?

Admiral **McDonald**. Yes, sir.

Senator **Andrews**. You are contemplating buying 600 of these engines but you are not looking at retrofitting the ones already in the inventory with a new engine?

Admiral **McDonald**. Yes, sir, we will have to go back and retrofit. The real answer to your question is about 845 airplanes will have it eventually, except for those aircraft that have retired——

Senator **Andrews**. Now, we get to what I had guessed originally your answer should have been, that, yes, we are contemplating buying 1,600 of these 414A's. Your compatriot is shaking his head.

Admiral **McDonald**. That is right. I am going to let him answer that because some of those aircraft are not going to be re-equipped.

Admiral **Seymour**. The reason we are not going to buy new engines to retrofit is that we buy a kit to modify the engine that is in the airplane.

Senator **Andrews**. You can buy the kit to make the 414 engines into 414A engines?

Admiral **Seymour**. Yes, sir. We are currently buying kits to make the 414A; through 1982 we brought 485 airplanes.

Senator **Andrews**. What kind of warranty do you have on these 414 engines that you now have?

Admiral **Seymour**. None, sir, other than the standard defects clause that I mentioned earlier.

Senator **Andrews**. And the 414A's you are getting no warranty?

Admiral **Seymour**. The new engines we buy will have an expanded warranty if our negotiations are successful. That is on all equipment we procure under procurements accounts for a 2-year warranty against defects and a 3,000-hour, low-cycle fatigue warranty.

Senator **Andrews**. It is a far cry from the warranties we were talking about yesterday.

Admiral **Seymour**. Totally different.

A-6E

Senator **Andrews**. What is the impact if you don't get $247.7 million for the A-6E's this year?

Admiral **McDonald**. That will, of course, terminate the A-6 line in 1983; that will have no direct impact on force levels in 1983. It eventually will have an impact in the out-years, Mr. Chairman.

There are several A-6E's in the inventory which we have bought that will maintain force level until the year 1986-87; however, without continued A-6E procurement in those years, 1986-87, the U.S. Marine Corps and the U.S. Navy would then have to face either drawing down on the aircraft in each of the squadrons or turn to consolidating squadrons to maintain A-6's in the inventory.

F/A-18 ENGINE MODS

Senator **Andrews**. What kind of modifications are you planning to make to the F/A-18? You have $11.8 million for modifying this new bird.

Commodore **Weaver**. That $11.8 million represents a percentage of the overall procurement cost. That is a reflection of those changes that we find during the FSD, Techeval, and Opeval programs. They are minor modifications and are essential to the program, not a significant amount of money relative to the overall cost for that number of aircraft.

ECX

Senator **Andrews**. When do you expect the EC-130 aircraft replacement to be operational?

Admiral **McDonald**. Mr. Chairman, we are still looking to the ECX proposal. Admiral Seymour is preparing a request for proposal. It should be to industry in the near timeframe.

We should have that selected aircraft operational in the 1987 timeframe.

A-6E

Senator **Andrews**. General White, on the issue of the A-6, the Senate-passed authorization bill would transfer the Marine Corps inventory A-6E aircraft to the Navy and replace the Marine Corps A-6's with F/A-18's. What is the Marine Corps position on this A-6E program?

General **White**. The Marine Corps position is that we are fundamentally opposed to a transfer of Marine A-6E aircraft to anybody until a suitable replacement has been identified of equal capability.

Senator **Rudman**. I have a number of questions I want to ask these witnesses. I think some have some significance in terms of the preferred mix to the Navy/CBO report on the 17th of May. I would like to submit them for the record, because I have run out of time.

[CLERK'S NOTE.—The questions, together with responses, appear at the conclusion of the hearing.]

F-14 IMPROVEMENTS

Senator ANDREWS. Admiral McDonald, in your statement you call the F-14 the best interceptor in the world, yet you urge that significant improvements to the engine and weapon systems are necessary. Can you explain this more fully and identify the parts?

Admiral McDONALD. Yes, sir, we are looking to improving, as I indicated, the TF-30, the engine, as you are well aware.

We have also installed, in an aircraft at Grumman, the 101 DFE engine, the derivative fighter engine, to see what type of improvement that will give us in engine performance.

In addition, we are looking to a programmable signal processor in the aircraft and an upgrade of the avionics in the airplane.

FALKLAND ISLANDS

Senator ANDREWS. Speaking of avionics in the airplane, and given the situation in the Falkland Islands, as I understand from what I read in the Washington Post, we have the Argentine airplanes flying over and dropping 1,000-pound iron bombs and taking ships out. That is pretty elementary; they have been around for 25 or 30 years.

Where are all the electronics, either on the carriers or the British Harriers, or the ships they are defending? As far as naval power is concerned, it is appalling to some of us. I have some pretty good friends who used to fly for the Navy. They have always told me you guys have everything under control, and here we see the British who essentially have the same kind of blackbox stuff, getting some of the more modern ships in their inventory sunk by old 1,000-pound iron bombs.

Are these pilots Colin Kelly's updated? There are not many people around who remember Colin Kelly, but that dates me.

What the devil has happened?

Admiral McDONALD. I can understand your concern, Mr. Chairman. We share that concern in certain areas.

I would say that looking at the last part and not trying to be glib or frivolous, the Argentine pilots, most of them, have been trained at Pensacola in the naval air training program in the past. So, we are looking at people with a basic capability pretty much like all of us have. However, I don't think they have had the opportunity to exercise as frequently or in the full spectrum of air warfare as we do as we try to maintain proficiency.

Senator ANDREWS. I am assuming the American pilots would be as good or better than the Argentine pilots. Here these guys are out flying rather old birds, dropping old ordnance and totally confounding our British allies who are supposed to have all this fantastic gobbledegook that we have been told for two decades is the stuff we have to keep buying because it works so well.

Admiral McDONALD. We have to look at what British fighting force is on scene at the time. As far as the airwing is concerned, as General White pointed out in his earlier comments to Senator Stennis and the committee, they have a relatively small number of Sea Harriers in place on *Hermes* and *Invincible*. Other than that, they really don't have any air wing down there as we do in the U.S. Navy to support that battle force which is lying pretty much at anchor in some of the latest escapades, as I read it in the Post, also, sir, in the public domain, supporting the beachhead that has been established.

If they had the capabilities that we feel certain that we enjoy in our air wing and in the way we deploy battle groups, I think you would see an entirely different scenario develop.

I am not alibiing in any way the British, what is perceived to be in effect, an ineffectuality against the older aircraft such as A-4's and Mirages they are bringing out from long distance.

If you could see the F-14 operating in a combat air patrol several hundred miles ahead of either control ship, whether carrier or cruiser, with radars from the surface illuminating inbound threats and with the F-14 using its own radar to further locate and help guide the pilots with their missiles that they have onboard, almost all of those threats, we think, would have been turned away long before the got to the main body, which is lying in the Falklands.

There is no early warning that the British have, at least as far as E-2 capability. The E-2C Hawkeye that we have is our radar plane that we put out [deleted] from the carrier battle group and it projects its radars for another [deleted].

So, they are operating sort of in the blind until the threat force gets within surface-ship radars. Unfortunately, they don't have the capability of repelling all those air attacks with the small number of Harriers that they have or in the time that they have to get the Harriers airborne to intercept the threat unless they happen to already be in the air.

So, I think it is very difficult to try to compare what is happening to the British Royal Navy in the confrontation in the Falklands with the Argentine Air Force and the way we would go about that just due to the fact we have greater assets and greater capability.

I don't think we can draw any conclusion at this time, Mr. Chairman, over that type of scenario.

Senator ANDREWS. These British ships, destroyers and frigates, and ECM systems that they have mounted on them are not capable of knocking down a plane that comes close enough to drop an old-fashioned bomb on them or on the ships that are stationed there?

Admiral McDONALD. They should be. One of the things that disturbs me, as it does you, concerns the iron bombs, because in the iron bomb deployment you have to come practically over the target one way or the other to get rid of it and to deliver it effectively.

Senator ANDREWS. It is nice to intercept [deleted] out and obviously you need to do that if you are going to protect against the Exocet missile or whatever else is coming in. You would have to intercept them before they get 20 or 30 miles from the ship.

They are not knocking off the British ship with a sophisticated standoff-type missile; they are knocking them off with the old-fashioned stuff that has been around for 35 years.

Admiral McDONALD. Once you allow significant numbers of aircraft to get into the force, you have problems unless you can effectively use, in the case of the British, the NATO Sea Sparrow, the other close-in weapon systems that they may have onboard to take them down. Once the aircraft get in close, unless you put up a significant fire curtain, then you are going to take some weapon hits in close.

We hopefully have defended against that relatively well. We do use, where we can, electronic countermeasures to, in fact, get rid of missiles, create targeting problems for them. But when you get an iron bomber in close, we would take him on with our close-in weapon systems, the Sea Sparrows.

Senator ANDREWS. Don't the British have the same kinds of close-in weapon systems?

Admiral McDONALD. No, sir, they don't.

Senator ANDREWS. Defensive missiles on their ships are not comparable to the defensive weapon systems or missiles we have on our ship?

Admiral McDONALD. Yes, sir, they do have to a degree some of the things that we do, but they are letting the whole wave get to the force to be addressed by what ever is available in very close proximity where, hopefully, our airwing composition and early warning would have attrited significant numbers of those before they got in.

QUALITY OF CLOSE-IN MISSILE DEFENSE

Senator ANDREWS. The thing that you bring out is the inference that our ships have better close-in missile defense capability than the British ships. Did I hear you right?

Admiral McDONALD. We think that we do in the ships that we would have deployed with the battle group, Mr. Chairman. I am not totally familiar with how the British are employing their ships in the Falkland environment, as to how they have planned for self-defense against air attack.

It is very difficult how they are trying to address the threat with the information that we have available to us.

The British have NATO Sea Sparrows; they have other surface-to-air short-range missiles that they use. We have developed, which is unique to us, to my knowledge, the Vulcan Phalanx close-in weapons system which is a very rapid-fire weapon, which we primarily plan to use against penetrating missiles, those air-to-surface missiles that we would have addressed, close-in, but the system can also be used against aircraft in close.

The British do not have that. That is not the sole antiair defense though. It is based on how you arrange your forces and it is unfortunate that in this particular scenario, to really defend yourself properly you need either significant air ashore or significant air at sea; the British have neither at the present time.

Senator ANDREWS. Then there is the big carrier versus the small carrier question we have been debating for a long time.

The other part, and the part that is concerning me and many of my colleagues on this subcommittee and throughout the Senate, is the fact that here are some of the most modern British ships pulled out of NATO North Atlantic duties; they are the ones that, if anything happens in the North Atlantic, we would expect to be side by side with our Navy. We would expect to have the same type of capabilities. They are our closest allies. They would be sticking out protecting our ships. I would imagine in any NATO-type scrap we would have British frigates and destroyers helping to protect our aircraft carriers, along with our own.

All of a sudden we find that either they don't have the type of close-in missile support that we take for granted and have on our ships, or that the systems simply don't work.

That is kind of appalling to us, that Argentine pilots can get in that close to a modern navy ship. These are not massive waves. From what I understand, this is 10 or 15 planes, 5 or 6 planes, coming in. You would almost think a couple of frigates and a couple of destroyers out there would have enough missiles to make it pretty darned tough for a half dozen planes that come in that close.

Admiral McDONALD. I would have to go, again, to look at the ships, Mr. chairman, and call your attention to the ships that they are really getting to. You are talking to frigates and to destroyers, the *Sheffield* and the more recent destroyer, and then there were three frigates that have been sunk.

You have to look at the capability of those ships, what they were designed to do and what they can do to protect themselves. You have to consider that a frigate is built primarily for an ASW convoy-type role and is very lightly defended or is very lightly self-defended in an anti-air warfare role. It would primarily be in an environment where it would have other ships protecting it, adding to the battle group complement, such as our CG–47's which will be our Aegis cruisers, which will address the anti-air warfare threat much more so than the DD–963 which has the same hull. If you get a mix of ships that doesn't fit the scenario very well, you expose some of these vulnerabilites.

That is why we try to work carefully with the battle group to give that synergism of defense, survivability, and lack of vulnerability that we would hope to carry in any kind of confrontation we run into.

Unfortunately, as I said, the British do not have the capability today when compared to what they had maybe 15 years ago, just because of the cuts they have suffered in their defense budget.

Senator ANDREWS. It is kind of appalling to me that we find one ship is sunk by a bomb that went in there and lay there unexploded for 3 days. They tried to disarm it but could not. Again, it was a plain old-fashioned bomb.

Admiral McDONALD. Could I call on Admiral Hostettler, who is our surface warfare representative, who commanded the same type of ship you are talking to?

SURFACE-TO-AIR CAPABILITY

Admiral HOSTETTLER. A couple of things come to mind:

First of all, the surface-to-air capability in our AAW ships, even going back to the ones built in the early 1960's, is better than what is in those British ships. Why? We have the technology. We put the dollars into it. We managed the program. Unfortunately, through budget constraint, they were not able. It was not as good a system as they wished; the British admitted that in the beginning. When they lost their large carrier, they lost their program for the upgrade of surface-to-air missiles.

Second, we do have defense in depth in our task group. The Standard Missile II will intercept out to the [deleted] mile area, followed up by Standard Missile I on our FFG's, which will go out [deleted].

Then Sea Sparrow will intercept at [deleted] miles. Does it take all that? Yes, it does.

One thing I noticed down there, other than the fact they are sitting down there in the bay patroling stations out in the water, they have no warning. Aircraft are coming in on the deck at 50 to 100 feet. I can tell you that even on my cruiser, sir, I would have been a sitting duck if I knew that he could come in to within visual range on the horizon at 250 feet altitude.

You take away our capability if you allow him to do that. With the system we have and working with air group surveillance, you can't afford to allow that—and I would echo Admiral McDonald—you cannot afford to allow the enemy the luxury—I don't care if he is flying a biplane—to come in that close, that low, with any kind of weapon.

Senator ANDREWS. Their tactical program down there, are they not keeping two or three radars in the area to pick these things up that come close in?

Admiral HOSTETTLER. They don't have enough surveillance aircraft. I don't think their aircraft have had the time on station to do it. Also, the threat is coming over the beach, and avoiding any shipboard radar capability. That shipboard radar is landlocked. They are coming in over the beach and they are coming in on the deck at the ships. The ships only have 15 or 20 seconds to literally start to react.

Senator ANDREWS. They are coming from the Argentine mainland, however.

Admiral HOSTETTLER. Yes, sir, there is nothing picking them up, apparently, as they are making their approach on the ships; they are coming over the hill, as I understand, out of the west, coming in over the bay and hitting them low on the water. So. they don't have much of a choice.

Admiral MCDONALD. Tactically, I have the same question you do: They probably would like to deploy some of their forces west of the Falkland Islands to act as early warning. They might not be able to do that based on the size of the force that is there and the support that is needed for the handling. I don't know that, Mr. Chairman; that is all speculative in the way of tactics, as to how you would address the program. Obviously, your concern, and mine, would echo that. It is obvious that you cannot fly from the air bases in Argentina on the deck with whatever pounds of ordnance they are carrying on A-4's or Mirages and fly all the way out there, roughly 500 miles, and get back. You are going to have to go high, low, high back. If they could devise some way of early warning and then communicate through interconnectivity to the people who would soon be under an attack, it would appear to reasonably redress much of the problem.

Senator **Andrews**. Again, if the Harriers could get a base on land, it would give them more hours of flight time capability and they could pick up a lot of those planes.

Admiral **McDonald**. You have to remember that the Harrier has very limited radar. The Sea Harrier has a fighter-type radar which is limited in range, so really unless he has somebody telling him where to go, he is probably not going to get very much early warning.

General **White**. Mr. Chairman, the British, like the U.S. Marine Corps, have radar which it is, I believe, their intention to set up in this San Carlos lodgment, so they will have a degree of radar warning for the Argentines coming in from the mainland.

As I said earlier in my statement in response to Senator Stennis, the intentions are to displace the RAF Harrier, not the Sea Harrier, displace them to austere, quickly made pads, dispersed pads in the lodgment. Once that takes place they will have the ability to maneuver those ships out of that sound.

I have to say, as a marine, not as a naval officer but as a marine, that is the price you pay for an amphibious operation.

If the commander has chosen that site and can find a site, so be it; you take your losses. You have to keep in mind the strategic purpose of the Royal Navy being down there has been accomplished; they have gotten their landing force ashore, apparently in strength, with proper equipment to go ahead and successfully pursue a land campaign.

Senator **Andrews**. What gives us all the willies is how close are they going to bring the QE–II with a couple of Exocet missiles left?

General **White**. They will go through the same routine we go through when we bring in our transports. We take helicopters. The QE–II has pads. You transfer the troops off the vulnerable ships to amphibious ships and remove the warships from the landing area. I don't think you will see the QE–II anywhere near the Falkland Islands.

Senator **Andrews**. I would hope not.

SUBMITTED QUESTIONS

You have been most helpful. We have a series of questions for the record, Admiral and General.

We appreciate your coming here today.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

ADDITIONAL COMMITTEE QUESTIONS
DEPARTMENT OF THE NAVY

TACTICAL AIRCRAFT ACQUISITION

QUESTION: Please explain and justify the large increase in tactical aircraft acquisition targets in the coming decade. Indicate how they relate to the 15-carrier battle group concept.

ANSWER: Tactical aircraft procurement is structured in our plan to increase Navy force levels from the existing 12 CVBG's to a minimum requirement of 15 CVBG's. The aircraft procurement rates established in the FY-83 FYDP provide for the attainment of the thirteenth and fourteenth airwings in consonance with the delivery of USS VINSON and USS ROOSEVELT within the FYDP years. Continued procurement at the out-year FYDP rates will provide an aircraft inventory which will support the formation of a fifteenth airwing in the early 1990's in conjunction with the delivery of a fifteenth deployable carrier. It should be noted that recent procurement history has not been at a level which is required to maintain the existing force structure with an acceptable force average age. On a long term average, approximately 324 aircraft are required per year to maintain the existing force structure and approximately 349 aircraft will be required per year to maintain a force structure composed of fifteen airwings. Out-year FYDP procurement is somewhat above the sustaining level to initially build the three additional airwings and associated support elements.

F/A-18

QUESTION: GAO concluded that support costs could be reduced by consolidating all F/A-18 avionics and radar component repairs at Lemoore and Cecil Air Stations. We understand that this recommendation has been under review for some time. Has the Navy reached any conclusions yet?

ANSWER: The Navy has concluded, on the strength of a very detailed Rand Corporation study of this proposal, that the suggested consolidation is not cost-effective. Further, consolidation of these facilities was judged to have an adverse effect on total force readiness. The establishment of overseas repair facilities to support deployed Navy carriers and Marine Corps units would have a similar effect. It is essential that avionics and radar repair capability accompany our deployed units if sustained readiness is to be maintained.

QUESTION: Navy has been studying a GAO recommendation to expand F/A-18 squadrons from 12 to 24 aircraft in order to save personnel and equipment overhead costs. Is this a viable option?

ANSWER: The Navy does not consider consolidation of existing squadrons into 24-aircraft units to be a viable option. While the concept offers some marginal cost benefits, these are outweighed by the operational limitations such a change would impose on tactical commanders in combat.

QUESTION: One of the arguments against this proposal is that squadron expansion reduces the "employment options" available to tactical commanders. How was this conclusion derived?

ANSWER: This conclusion is based on the combined combat experience and professional judgment of the Navy and Marine Corps' most senior officers. It is fundamental, and essential, that the myriad of mission requirements facing today's tactical commanders be broken down into elements which lend themselves to decision and action. The organization of his forces must contribute to, rather than complicate that process. Experience has shown that there is an overwhelming argument for restraining the size of each unit in the force to that which enables an effective response to its share of the total task. The structure of the total force must allow the on-scene commander to quickly and rationally allocate an appropriate share of his assets to each of the many requirements he faces. In the case of the F/A-18, that basic share of the total available force is the 12-aircraft squadron.

QUESTION: The Navy recently completed a review of GAO proposals which could reduce the quantity and cost of F/A-18 avionics test equipment. Although Navy concluded that the multi-porting of the avionics test set is a line option, this alternative is not being pursued at this time. Why?

ANSWER: The cost of the multi-port avionics test set was estimated to exceed that of the single port set by $2 million per unit in 1980. While the multi-port set does permit the simultaneous testing of selected components, it does not, as the name implies, provide twice or greater the capacity of existing sets. Given the current funding constraints, and shared concerns over total program costs, the Navy does not consider the multi-port avionics test set to be a prudent investment.

QUESTION: Navy plans to procure 7 avionics test sets in FY 1983 for $28 million. What would be the cost of multi-porting these sets?

ANSWER: The cost of multi-porting these 7 sets is estimated to be $14.695 million in FY 1983. That cost must be added to the $28 million required for procurement.

F-14 TOMCAT FIGHTER

QUESTION: Admiral McDonald, in your statement you call the F-14 the best interceptor in the world, but urge that significant improvements to the engine and weapons system are necessary. Can you explain this more fully and identify the costs?

ANSWER: The F-14 was designed in the late sixties and introduced to the fleet in the early seventies. When it first appeared, it was a revolutionary step in fighter/interceptor weapons system performance, particularly in its ability to track and fire at numerous targets simultaneously. It still is the best interceptor in the Free World, but it is necessary to improve its performance to keep pace with expanding threat capability. The TF-30 engine has had serious problems in operability, reliability, and maintainability. The TF30-414A component improvement program is designed to address that engine's most serious problems, and we are investigating the possibility of changing engines in future production aircraft. We are in the process of converting the analog AWG-9 radar processor to digital technology with the benefits outlined in my prepared statement. We are also investing about $90 million of RDT&E money over the next six years to further improve the radar's performance with emphasis on ECCM performance, reliability, and maintainability. If we expect the F-14 to retain its preeminence as a fighter/interceptor beyond the year 2000, we must continue to upgrade its capabilities in advance of the emerging threat.

QUESTION: In the interest of maintaining economic production rates, the House Armed Services Committee proposed adding $179 million to the fiscal year 1983 request of $915 million and making it 30 rather than 24 planes. How much would this reduce the unit cost of these aircraft?

ANSWER: Procuring 30 aircraft in FY 1983 vice 24 would reduce the unit flyaway cost of the F-14 by approximately $2.1 million.

QUESTION: Despite plans in 1981 to terminate F-14 production funding in fiscal year 1983, we are now considering adding over 300 aircraft at a cost of $24 billion. How have our requirements changed?

ANSWER: The additional 336 aircraft revealed in this year's request will bring our total buy to 845, which is the number required to build our force to 24 squadrons and maintain them until the year 2000. The growth from 18 to 24 F-14 squadrons is a direct result of the increasing capability of the Soviet air threat to our carriers.

QUESTION: Please detail and justify F-14 cost increases reported in the latest SAR.

ANSWER: The F-14 cost increases reported in the latest SAR are exclusively related to the decision to extend F-14 acquisitions from 509 aircraft terminating in FY 1983 to 845 aircraft, an extension of 30 aircraft per year from 1984 to 1994 terminating with six aircraft in 1995. In constant base year dollars, the unit cost of the F-14 will decrease slightly as a result of extending procurements.

AV-8B HARRIER ATTACK AIRCRAFT

QUESTION: At a cost of $9 billion, the Navy plans to buy 336 AV-8B Harrier II production aircraft for the Marine Corps. How do the capabilities of this improved aircraft compare with the British version now on station in the Falkland Islands?

ANSWER A performance comparison of Sea Harrier/GR-3/AV-8A with AV-8B is as follows:

> The RAF GR-3, Marine AV-8A/C and RN Sea Harrier have nearly identical range/payload characteristics; all three have the same wing, engine, store stations and guns. The RAF GR-3 has an inertial platform and laser aided weapon aiming/target tracking system. The RN Sea Harrier has an air intercept/air-to-surface radar and a new raised cockpit which resembles the AV-8B profile. All three carry the Sidewinder missile and 30mm Aden guns.
>
> The AV-8B has a new, larger supercritical wing which interacts with engine nozzles to greatly improve STOL performance and doubles the range or payload. It also carries 50 percent more internal fuel and has the capability to deliver most of the conventional ordnance being developed or in the inventory.

The Hermes (12°) and Invincible (7°) have "Ski Jump" decks which permit full gross weight take-offs by any Harrier. The following table compares the four aircraft in missions capability for operations from Ski Jump-equipped ASW cruisers/LHA's.

RANGE - PAYLOAD COMPARISON

	GR-3/AV-8A SEA HARRIER	AV-8B
LOAD	(Deleted)	(Deleted)
RADIUS TOS	(Deleted)	(Deleted)
LOAD	(Deleted)	(Deleted)
STATION RADIUS TOS	(Deleted)	(Deleted)

QUESTION: Why did we see a $2 billion increase in total program cost estimates last year? Are costs still going up?

ANSWER: Fiscal Year 1982 OSD imposed escalation rates did not closely parallel the rate of actual inflation, resulting in under pricing of the entire DOD aircraft procurement plan. Fiscal Year 1983 escalation rates, as set by OSD, are considered to be more in line with actual economic conditions (i.e., inflation). The differences in program pricing under these OSD pricing factors amounts to $1096.7 million. It is to be noted that this condition is applicable to all aviation weapons system pricing.

The procurement schedule slippage due to program stretchout, which is a function of DON priorities, accounts for $214.4 million.

Engineering costs of enfolding the 25mm gun system (which was directed by DSARC II) amounts to $19.5 million.

The support cost increase of $715 million over the remaining seven years of the program is due, primarily, to better definition of the requirements and revised policy in regard to depot pipeline and initial spares. The manner in which the AV-8B was inserted for the first time into the Fiscal Year 1982 budget did not provide the oportunity for a detailed workup by the Naval Air Systems Command. The costs presented in the Fiscal Year 1983 budget reflect the results of this detailed analysis and the additional time available to further evaluate the support program, subsequent to submission of the Fiscal Year 1983 budget, has increased our confidence in these numbers. It is in the area of production rates that there is the greatest potential for additional program cost growth. If economic production rates are not achieved, then the program cost may increase. Conversely, if the procurement rates are increased to economic levels, there is the opportunity for significant cost savings.

QUESTION: In a year when we are hearing a great deal about economic production rates, why has the Navy's plan of buying 24 and 54 AV-8Bs in Fiscal Year 1983 and 1984, respectively, been changed to allow for only 18 and 30 in those years?

ANSWER: Aircraft procurement rates are a function of priority assigned by the Department of the Navy. Due to fiscal constraints, there are few DON aircraft being procured at the desired rate. The Marine Corps requirement of 12, 24, 54, etc., represents the minimum level of procurement to offset our light attack shortfall and to establish economics of scale for this aircraft. This issue is of great concern to us.

QUESTION: What are the deficiencies of the AV-8B that would be met through the planned development of an Advanced Vertical Lift Aircraft?

ANSWER: The AV-8B has no deficiencies as a V/STOL light attack aircraft, and meets the requirements specified by the Marine Corps for its close air support mission.

An advanced vertical lift aircraft could be designed for other tactical air missions such as supersonic interceptor or all weather attack.

TAV-8B

QUESTION: The Senate Armed Services Committees has added $22.0 million to the authorization to fund the development of a new trainer for Marine Corps V/STOL requirements, called the TAV-8B. We understand that the Marines support this add-on. Why can't we wait until FY 1984 to start this program?

ANSWER: It is essential that we get started now with the development of the two-seat version of AV-8B in order to meet our vastly expanded V/STOL training requirement of 1986 and beyond. During this time frame, the A-4M transition to AV-8B will occur and will create training loads far in excess of current training capacity.

From funding and authority to proceed, until delivery of the first two-seater is estimated to be 32-36 months. Therefore, funding in Fiscal Year 1983 is considered essential.

The urgency of the need is based upon recent studies of the originally planned alternative of using the TAV-8A aircraft for training. USMC, GAO and USN conclusions are unanimous that for cost, training compatibility, mission suitability, and growth potential, the TAV-8B is the correct route to take.

TAV-8A

QUESTION: Do we now have an open TAV-8A production line?

ANSWER: To the best of our knowledge, the last TAV-8A type aircraft was ordered in November 1979 but has not yet been delivered.

The Indian Navy may order additional two seat TAV-8A aircraft in the near future, but this is not confirmed.

It is to be noted that the TAV-8A configuration and technology do not meet the USMC requirement for AV-8B training.

TAV-8B

QUESTION: What would be the total acquisition cost of the TAV-8B program?

ANSWER: The estimated development cost of the TAV-8B configuration is $163.0 million.

The additional procurement cost of 24 TAV-8B trainer aircraft in lieu of 24 AV-8B single seat aircraft is $24.0 million, or a delta of $1.0 million per copy.

It is important to note that we fully intend to fund the

TAV-8B development and procurement costs from within the total 336 aircraft budget. This, of course, assumes sufficient procurement rate to provide this flexibility while the light attack shortfalls are satisfied.

AV-8 RELIABILITY

QUESTION: The Committee has been following with increasing concern the accident record of the AV-8. How many of the original 110 AV-8A and TAV-8A aircraft remain in operating status? How many have been lost in accidents?

ANSWER: Of the original 110 AV-8A and TAV-8A aircraft purchased, 66 are in operating status either as T/AV-8A's, AV8C's, or YAV8B's. Forty three aircraft have been lost in operational or test program accidents and one aircraft was lost in a planned test to destruction in wind tunnel/fatigue life testing.

QUESTION: How does the accident rate of the AV-8 compare to that of other aircraft such as the F-4, A-4, and A-7? How does it compare to the all Navy-Marine Corps TACAIR average?

ANSWER: The AV-8A compares favorably with the F-4, A-4, and A-7 in mishaps during the first 135,000 hours or 135,000 sorties (approximate lifetime experience with the AV-8A). All Navy-Marine Corps TACAIR rates over the past four years have averaged 2.5 to 6 times lower than AV-8A rates for the same years. It is fully anticipated that with the AV-8B design improvements, the VSTOL accident rate will be comparable or below the average of other TACAIR.

QUESTION: For each year the Marines have been operating the AV-8, what has been the engine related accident rate? Specifically, how many accidents involved engine performance as a contributing factor?

ANSWER: Of the 50 Class A mishaps in the T/AV-8A to date (43 of which resulted in destroyed aircraft), in both the operational and test environment, 14 (28%) involved the engine as a factor. It should be noted here, that the improvements being made to the AV-8B engine will make it a very reliable and safe powerplant.

QUESTION: For the record, please supply full details on these accident rate questions and include percentage of AV-8 accidents that involve the following factors:
- V/STOL take-off/landing operations
- pilot error
- supervisory
- engine failure or related factors including Navy and contractor losses

ANSWER: The factors involved in all AV-8A mishaps breakdown as follows:

- V/STOL take-off/landing	33%
- pilot error	63%
- supervisory	33%
- engine failure	28%
- Navy/contractor	8%

The figures are not additive as more than one cause factor is usually involved in each mishap.

QUESTION: We understand there have been three fatal accidents since last December in AV-8s. How many of these involved pilot error and what were the pilots' experience levels?

ANSWER: Since 1 December 1981 there have been three fatal mishaps involving AV-8A's. All three are still under investigation. However, preliminary indications are that they each involved pilot error as a cause factor. All of the pilots had less than 300 hours in the AV-8A.

QUESTION: Do you consider the AV-8B a distinct improvement over the A model? Specifically, what improvements are important? Do they include safety and reliability?

ANSWER: The superb combat capabilities of the AV-8B have been developed in parallel with very significant improvements in both V/STOL flight characteristics and the improved Pegasus - 406 engine. The NASA/McDonnell-Douglas/British Aerospace aerodynamic improvements which have permitted doubling the range or payload, have also reduced the thrust borne to wing borne transition phase of flight from a 60 knot band in the AV-8A to a 12 knot band in the AV-8B. Incorporation of a fully active, state-of-the-art, stability augmentation attitude hold system (SAAHS) has been demonstrated in the Full Scale Development AV-8B as reducing dramatically the pilot workload, compared to the AV-8A.

The following items summarize the major AV-8B improvements which provide the foundation for our high level of confidence in the flight safety characteristics of the new AV-8B:

- Improved flight visibility for the pilot.
- Modern cockpit displays and switchology with proven systems (including use of applicable F/A-18 systems).
- Hands-on-throttle and stick (HOTAS) for those systems essential to flight and those critical to combat mission accomplishment (reduced pilot workload).
- Supercritical wing for high cruise efficiency, better handling characteristics, low speed airfoil effectiveness, and more fuel capacity. Increased reaction control/thrust control moment in V/STOL flight.
- Stability augmentation attitude hold system (SAAHS) for handling ease in V/STOL flight regime.
- Lift improvement devices (LIDs) for improved stability and vertical lift margins for V/STOL takeoff/landing capability phase of flight.

These and other improvements are designed to make dramatic improvements in effectiveness, safety, reliability, and maintainability.

QUESTION: What about the AV-8B engine? Isn't it just another modification of the A model engine, which is basically 1960 technology?

ANSWER: The basic four poster vectored thrust concept of the Pegasus II engine has not changed. However, we now have more than a decade of operational experience under our belts - operating from a variety of scenarios.

The AV-8B F406 Engine incorporates improvements specifically designed to overcome known design limitations, and to improve engine performance.

This is considered a reliable, maintainable engine, proven to be of very low risk.

- Engine improvements consist of the following:
  - -- F406 Engine (500 Hour Hot Section Inspection for reduced inspection requirements).

- -- New Shrouded LP-1/2 Turbines.
- -- New wide root front fan and blades which remove all adverse harmonic vibration impulses for normal flight.
- -- Improved reliability/maintainability by correction of all service revealed deficiencies of the AV-8A engine (F402).
- -- Improved fuel efficiency.
- -- Improved corrosion resistance.
- -- Increased logistical support costs.

QUESTION: What is the status of AV-8B engine flight testing to date? Please provide a detailed progress report for the record.

ANSWER: The AV-8B engine is not in a development status in that the improvements have been in the area of reliability and maintainability. The AV-8B airframe is undergoing engine performance trials at Edwards Air Force Base California. Some minor engine compressor stalls have been experienced during flight envelope expansion tests. The cause of this discrepancy has been identified and corrective redesign is underway.

AV-8B COST/OPERATION

QUESTION: Is it true the AV-8 now costs more than even the very expensive F/A-18? What is the unit cost of the AV-8 now and how does it compare to not only the F/A-18 but the F-14 and A-6? For that matter, how does the AV-8 unit cost compare to that of the AH-64 attack helicopter?

ANSWER: Senator, the AV-8B is now just getting started down the learning curve, upon which the F/A-18 is already well established. Therefore, the AV-8B is more expensive in its early years. Due to program stretchout, economies of scale have not been achieved. However, under current procurement plans, the AV-8B gets cheaper in 1985. A realistic cost comparison can be made by considering Fiscal Year 1983 and beyond, and by using the data contained in the Fiscal Year 1983 President's Estimate Aircraft Data Sheets. From this, a true measure of a cost comparison can readily be seen by using Unit Weapons System Cost. The comparison is as follows:

SYSTEM	COST
F-14A	$62.4 million
A-6E	$31.3 million
F/A-18	$24.9 million
AV-8B	$23.6 million

These costs are at present planned production rates. It is interesting to note that if AV-8B were procured at the rate and quantity of the F/A-18 buy, the Unit Weapons System Cost of AV-8B would be approximately$14.0 million as compared with $24.9 million for F/A-18.

The AH-64 is an Army program, the USMC is unable to provide cost information.

QUESTION: What is the maximum mission radius for the AV-8B for close air support? If we include a ground loiter at a forward pad where a vertical take-off and landing is required, how would that affect the mission radius?

ANSWER: Using the maximum iron bomb load of 16 MK-82 500# bombs, the AV-8B can take off from a 1000 ft dirt, grass, or bombed out section of a runway and proceed to a close air support target 155 miles away - spend 5 minutes to drop stores - and return to base with appropriate fuel reserve.

Another way to put the AV-8B mission radius capability into perspective is to compare the F/A-18 and AV-8B.

Based on recent Marine Corps analysis of data obtained from Naval Air Systems Command, the F/A-18 and AV-8B can be compared on a typical ground attack profile, under identical conditions, as follows:

	AV-8B	F/A-18
T/O Gross Wt.	(Deleted)	(Deleted)
Ext. Fuel Tanks	(Deleted)	(Deleted)
Bombs	(Deleted)	(Deleted)
Gun	(Deleted)	(Deleted)
T/O Ground Roll	(Deleted)	(Deleted)
Radius	(Deleted)	(Deleted)
Fuel Used	(Deleted)	(Deleted)

With respect to the ground loiter condition at a forward site, mission radius is not considered the critical element. By that I mean that the AV-8B is positioned in the forward site (usually within (deleted) of the target) to provide rapid response to calls for close air support effectively and accurately. By rapid response, I mean from mission request to bombs on target within (deleted) - a capability not provided by conventional aircraft.

In the unusual circumstances where no terrain for take-off roll is available, the AV-8B can take-off vertically with (deleted) of ordnance and hit a target 50 miles away. For a point target, AV-8B with Laser Mavericks on board, can take-off vertically and destroy a target (d) miles away.

QUESTION: For that ground loiter mission involving vertical take-off and landing, what weapons load can the AV-8B carry?

ANSWER: Typical VTO mission payloads for AV-8B, which vary in accordance with the type of target anticipated, are as follows:

- (D) Sidewinders with any of the following loads:
  - (D) MK-81
  - (D) MK-82
  - (D) MK-83 LGB
  - (D) Rockeye or APAM
  - (D) Maverick
  - (D) MK-77 Fire Bombs

This arrayment of ordnance is adequate to cause severe damage to a wide variety of targets including: troops in foxholes, armored personnel carriers, medium tanks artillery pieces, AAA installations, bunkers, or 3 ft. thick pillboxes.

What this means is that the AV-8B is the only free world aircraft capable of providing rapid response to close air support requirements, through either a vertical or rolling take-off.

QUESTION: For that same mission, what is the attack time available in the combat area?

ANSWER: It must be remembered that combat effectiveness in the close air support mission is a measure of timely response, first pass surprise attack, and weapons system accuracy. The mission usually entails fuel planning for a minimum of 5 minutes in the target area. Should the situation require more time on target, appropriate adjustments for fuel/weapons loading would be made to accommodate that requirement.

QUESTION: For comparable close air support missions, how does the AV-8 range and weapons payload compare to that of the F/A-18 and A-7?

ANSWER: The following average operational ordnance load/sortie can be delivered by the aircraft indicated:

	AV-8B	AV-8A	F/A-18	A-7
MK-82 LD/HD	(Deleted)	(Deleted)	(Deleted)	(Deleted)
MK-83	(D)	(D)	(D)	(D)
MK-84	(D)	(D)	(D)	(D)
MK-20	(D)	(D)	(D)	(D)
CBU-72	(D)	(D)	(D)	(D)
ZUNI Pods	(D)	(D)	(D)	(D)
MK-77	(D)	(D)	(D)	(D)
Laser Maverick	(D)	(D)	(D)	(D)
IIR Maverick	(D)	(D)	(D)	(D)
LGB-82	(D)	(D)	(D)	(D)
LLLGB-82	(D)	(D)	(D)	(D)
LGB-83	(D)	(D)	(D)	(D)
LLLGB-83	(D)	(D)	(D)	(D)
LGB-84	(D)	(D)	(D)	(D)
Gator	(D)	(D)	(D)	(D)

Based on recent Marine Corps analysis of data obtained from the Naval Air Systems Command, the AV-8B, F/A-18 and A-7 can be compared on a typical ground attack profile under identical conditions, as follows:

	AV-8B	F/A-18	A-7
T/O Gross Wt.	(Deleted)	(Deleted)	(Deleted)
Ext. Fuel Tanks	(D)	(D)	(D)
Load	(D)	(D)	(D)
Sidewinder	(D)	(D)	(D)
Gun	(D)	(D)	(D)
T/O Ground Roll	(D)	(D)	(D)
Radius	(D)	(D)	(D)
Fuel Used	(D)	(D)	(D)

AV-8B COST/COMPARISON

QUESTION: With all its expenses and problems and operating limitations, why isn't the Marine Corps considering alternatives to the AV-8? How would the AH-64 do in that role?

ANSWER: First, I must make it clear that there have been an absolute minimum of unprogrammed expenses and problems. As for operational limitations, the AV-8B has met or exceeded all design or desired operational capabilities.

A Marine Air Ground Task Force (MAGTF) not unlike a Carrier Battle Group (CVBG), is a unique instrumentof war that was developed by those who have and will be charged with fighting it. Accordingly, the separate and distinct roles and missions of the light attack and attack helicopter forces have been established by the Marine Corps to meet the specific warfighting needs of the MAGTF, and aircraft acquisition efforts have and must follow suit. To this end, the AV-8B program was established in response to a Marine Corps stated requirement to modernize its light attack force and will do so with transition beginning in early Fiscal Year 1984.

It is a simple fact-of-life that a helicopter, no matter how capable, is unable to perform the full spectrum of the light attack mission.

AV-8B COST/OPERATION

QUESTION: Please give us a side-by-side comparison of AV-8B and the AH-64 in close air support mission roles. Include night and adverse weather capabilities.

ANSWER: Senator, the AH-64 or any other helicopter does not meet USMC Close Air Support (CAS) mission requirements and, therefore, data for AH-64 in the CAS role is not available at our Headquarters.

A Marine Air Ground Task Force (MAGTF) not unlike a Carrier Battle Group (CVBG), is a unique instrument of war that was developed by those who have and will be charged with fighting it. Accordingly, the separate and distinct roles and missions of the light attack and attack helicopter forces have been established by the Marine Corps to meet the specific warfighting needs of the MAGTF, and aircraft acquisition efforts have and must follow suit. To this end, the AV-8B program was established in response to a Marine Corps stated requirement to modernize its light attack force and will do so with transition beginning in early Fiscal Year 1984.

It is a simple fact-of-life that a helicopter, no matter how capable, is unable to perform the full spectrum of the light attack mission.

JVX

QUESTION: Among budget give-ups offered by the Department this month was a $5 million reduction associated with consolidating the Marines' HXM assault helicopter development program with the JVX joint service rotary wing program. How much in total is in the 1983 budget for HXM? How would the JVX consolidation work?

ANSWER: The Navy's original FY 1983 budget request for V/HXM was for $9.5 million. With the Senate reduction of $4.5 million, $5.0 million remains. The JVX consolidation consists of the Marine Medium Assault Transport (V/HXM) program and the Army's Special Electronics Mission Aircraft (SEMA) program, along with additional resources provided by the U.S. Air Force to meet their requirement for a long range Special Operations/Search and Rescue aircraft. Rather than separate development ventures to meet their needs, the Navy, Army and Air Force have pooled resources to develop a common, multi-mission, advanced rotary winged vehicle which can be used by all four services in roles having similar technical requirements, such as speed, lifting capacity, etc. This common use aircraft, would then be outfitted with those sensors or systems unique to the individual service's mission needs. One can also envision a number of possible additional mission applications. These are under investigation and will take shape over the next year or so. Wide application of a common vehicle of this sort within the Department of Defense promises significant savings through the avoidance of duplicative development programs and also in life cycle support system costs.

QUESTION: Congress declined to fund the HXM last year, and the JVX program is not getting any ringing endorsements, either. If Congress should defer any expensive new helicopter development programs, what alternatives are available to fill the Marines' need for an assault lift aircraft?

ANSWER: There are a number of alternatives, none of which are very attractive, and all of which would have a seriously negative impact on the Marine Corps' future combat capabilities. All the alternatives involve continuation of or conversion to some "off-the-shelf" helicopter. Of the choices available, the worst ones would be the CH-47D or CH-53E. Both of these are very large machines, designed for heavy equipment lift support missions -trucks, artillery, light armored vehicles, etc.; they are too large and cumbersome to fit on our ships in the numbers required; and they would be very vulnerable in the combat environment in which our troop assault aircraft must be able to operate. With those two large helicopters ruled out as unacceptable, the two "off-the-shelf" alternatives that remain are the CH-46E and a Marine derivative of the Army's UH-60 "BLACKHAWK." The H-46 was introduced in the early 1960's and is now obsolete for a combat role, even in the current "E" version. We are still investing in improvements to the H-46, but that is only to keep it in useful condition until the Marines can replace it with JVX (V/HXM) in the 1990's and for its continued use as a Navy non-combat logistics aircraft into the 21st century. The H-60, while a fine aircraft in the Army's utility/squad carrier role, fails to meet the Marine Corps' HXM requirement for range, speed, numbers of troops and weight of support equipment which must be lifted. The adoption of an H-60-based Marine Corps troop assault force would have a wide-reaching negative impact in the Navy and the Marine Corps. To attain an adequate force projection capability equal to that of a JVX-based force, a significantly greater number of aircraft and amphibious ships would have to be acquired, with all the associated additional personnel and support program costs which would naturally follow.

The HXM requirement was formally documented for the first time in 1968. It has been reevaluated a number of times since then and remains essentially the same. These revalidations over the course of the last fourteen years serve to emphasize that the Marines understand their mission very well and know what they need to get their job done properly. The Navy has tried to meet the HXM requirement several times, but has not been successful, primarily due to financial considerations. The JVX program offers the best opportunity to date to meet the HXM requirement with an acceptable aircraft.

AV-8B COST/OPERATION

QUESTION: Please provide the following comparison data for the engines in the F/A-18, AV-8B, AH-64 and AH-1T:

- — Expected mean time between failure.
- -- Expected time between Hot Section Inspections.
- — Total man hours required to change and trim an engine.

ANSWER: Several factors exist which need amplification in order to provide a meaningful comparison of data on these engines.

The F/A-18 engine has been designed to be procured in large quantities with the latest available technology, whereas the AV-8A/B engine has been developed over a long period of time at a slow rate. Although a consideable amount of modern technology has been incorporated in the engine, the funding has been related to the size of the AV-8A/B fleet. The funding for the F/A-18 engine in the last five years has been over 20 times that for the AV-8B.

Helicopter engine comparisons with fixed wing aircraft engines cannot be made considering the differences in aircraft performance, engine ratings, and engine operating schedules.

The AV-8B engine is subjected to rigorous demands during take-off and landing from unimproved operating sites, demands which are inherent in providing the operational flexibility unique to the AV-8A/B. Considering the above, some quantitative comparisons between the F/A-18 and the AV-8A can be made:

	F/A-18 TO DATE	AV-8A
REMOVAL RATE/100 hr	5.04	5.8
(1) MFHBMA	8.8	5.6
(2) MMH/FH	1.8	3.0
(3) MSI	800 hrs	300 hrs

(1) Mean flight hours between maintenance action
(2) Maintenance man hours per flight hour (includes engine change)
(3) Hot section inspection

Two factors contribute to the high MMH/FH figure for the AV-8A:

The wing must be removed to change an engine.

The engine fuel control must be adjusted frequently because of the tolerances required for vertical take-off and landing.

The AV-8B engine design specifications contain the following goals:

REMOVAL RATE	5.2
MFHBMA	28.1
MMH/FH	1.75
HSI	500 hrs

Wing removal for an engine change will still be required since the aircraft was not completely redesigned. On the other hand the Royal Air Force, the Royal Navy and the USMC have evolved a very satisfactory means of making the engine change in the field and aboard ship. There is an improved fuel control under development that will when incorporated, make dramatic improvements in maintenance man hours per flight hour data.

QUESTION: In a recent GAO report the AV-8B was rated as being vulnerable and susceptible to battle damage. Please provide for the record a Survivability/Vulnerability Comparison of the following aircraft:

AV-8B, F/A-18, AH-64 and AH-1T

The comparison should include the relative radar cross sections, IR signature and specific aircraft design features which reduce vulnerability/susceptibility and ehnahce survivability.

ANSWER: A meaningful response to this request is difficult because data that are available on the four aircraft requested represent only physical measurements and does not consider such factors as employment tactics, mission duration/exposure time, visibility against various backgrounds, maneuverability, etc. As an example, the F/A-18 design incorporates numerous system redundancies and other features which would give it physical measurements indicating somewhat better survivability than the AV-8B, an adaptation of an existing airplane. The smaller size, however, makes the AV-8B more difficult than the F/A-18 to detect visually, by radar or IR signature. The AV-8B angle rate bombing set is passive. There are no electromagnetic emissions to provide warning of aircraft approach or a source for a radar homing missile. There is recent public recognition (IEEE Spectrum magazine, April 1982: "Radar: shield or target") that current U. S. radars (A-6; A-7; A-18, e.g.) may give an opponent a decisive advantage by braodcasting the position and makeup of the attacking U. S. forces. Similarly, any valid comparison between a helicopter and a fixed wing airplane must consider the dramatic speed advantage of the fixed wing airplane.

Major technical work to define survivability enhancement for the AV-8B is ongoing. These studies are examining the effectiveness of various design concepts in reducing aircraft vulnerability by protecting existing components or by adding an additional level of redundancy to certain systems. Concepts being evaluated in trade-off studies include: hydraulic reservoir level sensing, composite push-rods, composite control system bellcranks, redundant lines, self-sealing fuel lines, self-sealing fuel tanks, gross voided foam in fuel tanks, nitrogen inerting system and engine bay fire extinguisher. These potential enhancements will be measured against cost, weight, performance and program schedule penalties before an implementation decision is made. A major program review will be held in August 1982 to assess the survivability enhancements which are most practical and cost-effective for AV-8B production aircraft.

AH-1T COBRA ATTACK HELICOPTER

QUESTION: General White, does your enthusiasm for the AH-1T Cobra helicopter extend to considering a suitable substitute for the AH-64 Apache heliicopter?

ANSWER: No, the Marine Corps does not consider the AH-1T a substitute for the AH-64. We have plans for an increase in our attack helicopter forces from our present level of three active and one reserve squadrons to six active and two reserve squadrons. We desire to accomplish this increase with a "high/low mix" approach in terms of cost and technology. The 44 low cost, improved AH-1T Cobras in the Fiscal Year 1983 Five Year Defense Plan request will upgrade our three active squadrons from present strengths to their full authorized complement of 24 aircraft. The AH-1Js freed by this procurement will also allow our present reserve squadron, which is assigned only a detachment size complement of 8 aircraft, to increase to 24. For our additional three active squadrons we are considering procurement of an AAH to provide a more sophisticated night/marginal weather capability.

QUESTION: If we do not move into production buys of the AH-64, what is the impact on your plans for the Cobra program?

ANSWER: If the AH-64 does not go to production, the Marine Corps will consider additional AH-1T procurement for its planned force structure increase.

LAMPS HELICOPTERS

QUESTION: A classified GAO report issued last year examined some of the reasons for the near doubling of the LAMPS III helicopter program from $3.6 billion to $7 billion in just over one year. Over the same time frame the size of the program was revised downward. How many LAMPS III helos are currently in the program plan?

ANSWER: The cost growth in the LAMPS MK III program from $3.6 billion to $7 billion occurred over a period in excess of two years. The number of SH-60B helicopters in the LAMPS MK III program is 204 and has not changed since set at the DSARC IIC milestone in 1978.

LAMPS HELICOPTERS

QUESTION: Is the current program adequate to equip LAMPS III on all frigates, destroyers, and cruisers? When will this objective be reached?

ANSWER: The current program is to equip all active FFG-7's, DD-963's, DDG-993's, and CG-47's with the LAMPS MK III weapon system. This objective will be reached in FY 1994.

QUESTION: GAO contends that the Navy has significantly understated the total LAMPS III program cost by planning to produce fewer helos than minimally required. Is this a fair assessment?

ANSWER: This is not a fair assessment. The minimum requirement is one deployable SH-60B for each LAMPS MK III capable ship. When current planning factors are considered for training, pipeline, attrition and ship surge capability, a total of 186 SH-60B's will be required to support one deployable SH-60B aboard each of the projected 112 LAMPS MK III ships.

QUESTION: In many ways LAMPS III's effectiveness is tied to the use of the TACTAS long-range sensor system for detecting submarines. With the delays and development problems currently experienced with TACTAS, what has been the effect on the LAMPS III deployment plan?

ANSWER: There are no delays or development problems currently being experienced with the SQR-19 TACTAS program. This program is on schedule with a prototype system installed in USS MOOSBRUGGER (DD-980) currently undergoing at-sea testing. The progress of the TACTAS program does not affect the LAMPS MK III deployment plan. Although it is envisioned that TACTAS will be the primary "trigger" for LAMPS MK III, there are numerous other triggers that can be utilized by the LAMPS MK III system.

QUESTION: In previous testimony, Navy claimed that a re-engining program for the LAMPS I helos would cost about $800 million to support the planned inventory. How many helos are in the planned inventory?

ANSWER: The Navy is presently evaluating an unsolicited proposal to develop a prototype system of an SH-2F with T-700 engines. A preliminary cost-out to aid in the evaluation of this proposal estimated that a total of $872 million would be required to re-engine 178 SH-2F's, during FY 1986-1991. The 178 represents the planned inventory in 1986 and is based on the current inventory, historical attrition, and projected SH-2F procurement.

QUESTION: Similarly, Navy has provided information which indicates that re-engining LAMPS I could improve the effectiveness about 70 percent. Would there be any advantage to deploying re-engined LAMPS I helos on ships other than FF 1052 class frigates to meet the minimum needs?

ANSWER: The 70% improvement relates to an estimate of increased range resulting from the re-engining with the T-700 coupled with an increase in fuel capacity. On its own, the T-700 re-engining is projected to improve typical LAMPS I ASW mission time on station by 30 minutes, or 26%, over the SH-2F with T-58 engines and comparable fuel tank configuration.

Even if adopted, the T-700 re-engining would not enable LAMPS I to substitute for LAMPS III. LAMPS III represents a quantum advance in ASW effectiveness, reliability, maintainability, lift capacity, endurance and range over both current LAMPS I aircraft and the proposed T-700 SH-2F.

By way of factual clarification, LAMPS I helicopters are already deploying on ships other than FF-1052's.

QUESTION: In addition to the procurement cost for the LAMPS III helo itself, ships have to be modified to accommodate this system. FFG-7 class frigate modification costs of some $6 million per ship are expected. Are modification costs similar for destroyers and cruisers?

ANSWER: FFG-7 and DD-963 unit modification costs in FY 1982 dollars are approximately $12.5 million. CG-47 backfits will be $6.2 million, due to the less extensive physical modifications required for those ships.

QUESTION: GAO is of the opinion that the Navy has redefined the LAMPS III mission to principally anti-sub warfare and has downgraded the anti-surface ship mission. However, the Navy is continuing to procure equipment and spares for the secondary missions at a cost of $280 million. Is this necessary in view of the redefinition?

ANSWER: The ALQ-142 electronic support measures equipment and the APS-124 radar are essential to the LAMPS MK III ASW mission. The ALQ-142 can (deleted). Deletion of either of these equipments would significantly degrade ASW capability as well as negating Anti-Ship, Surveillance and Targeting (ASST) in even a secondary mission role. The decision to downgrade ASST to a secondary mission was in response to a Congressional mandate to minimize program costs.

QUESTION: Is it true that some of the ships will not be modified in time to take on this year's total procurement of LAMPS III helos?

ANSWER: By the end of FY 1985, (d) LAMPS III capable ships will be available and the FY 1983 SH-60B procurement will have increased LAMPS III aircraft inventory to (deleted) aircraft will be assigned to Fleet Replacement Squadrons to train aircrews for the next year's operational requirements. (Deleted) will be assigned to operating squadrons for deployments and predeployment training. (D) aircraft will be in excess of those assignments. The LAMPS III ship modification schedule will be completed in (deleted).

QUESTION: If so, how many helos will have to be stored until the ships are available?

ANSWER: Storage of aircraft requires investment of funds for preparations and incurs some risk of inadvertent deterioration over the period of storage. A determination has not been made as to whether the cost/risk considerations warrant storage vice maintaining the six excess aircraft in operational status until required.

QUESTION: Of the 48 LAMPS III helos in the budget, how many will be deployed upon delivery?

ANSWER: Of the 48 aircraft in the budget, (d) aircraft will be delivered for training squadron assignment and (d) will be assigned to operational squadrons. The disposition of the remaining (deleted) aircraft has not been determined. The actual deployment at sea of LAMPS III aircraft will follow several months of preparatory training in the operational squadrons.

QUESTION: Assuming the $450 million reduction proposed in the Senate Authorization Bill, the FY 1983 procurement will be reduced to 28 helos. Would all of these aircraft be assigned to modified ships upon delivery?

ANSWER: In 1985, (d) modified ships would be available for assigning of the (d) aircraft. The remaining (d) aircraft would probably be assigned to operational squadrons to commence predeployment training for 1986 available ships. This would result in a delay in establishing a second training squadron on the East Coast.

AIRCRAFT SUPPORT SYSTEMS

QUESTION: GAO estimates that the Navy and Air Force spend over $1.2 billion annually for ground service and maintenance systems. Both military services are experimenting with centralized ground support at airfields, but GAO feels that savings are being lost because the Air Force and Navy are using different equipment rather than standardized items. Is there any reason why Air Force and Navy ground support equipment shouldn't be standardized?

ANSWER: In principle standardization of support equipment is highly desired. However, different operating environments of Navy and Air Force units dictate subtle differences in otherwise common support equipment. The specialized requirements of carrier operations, demanding low profile, highly manueverable combination tow tractors/starting units, requires unique item specifications. Standardization of centralized ground support must not negate compatibility with the diverse operating environments and the units utilizing the equipment.

QUESTION: Navy estimates indicated to GAO that over $28 million could be saved if ground support equipment at each of the Naval Air Stations was centralized. Are these savings attainable in FY 1983?

ANSWER: Fiscal constraints preclude funding for installation of centralized systems at Naval Air Stations in FY 1983. Given the 2½ to 3 years required for installation the savings cited by GAO could not be attained in 1983 in any case.

QUESTION: The DOD response to GAO's findings was that savings from centralized support are reflected in the DOD budget. How much is reflected in the FY 1983 budget?

ANSWER: Although centralized support has been recommended for implementation at 11 air stations, current budgetary constraints and fleet priority considerations have not permitted approval of the MILCON projects in FY 1983. As a result, no savings from centralized support systems are reflected in the FY 1983 Navy budget.

SPARES PROCUREMENT

QUESTION: GAO concluded that $160 million could be saved if certain initial spares were procured concurrently with production material. What actions would have to be taken to realize these savings?

ANSWER: Savings on procurement of initial spares are being realized by procuring concurrently with production material. The concept is sound and is being applied wherever possible. No further action is needed for the Navy to realize savings by procuring spares concurrently with production material.

QUESTION: The Air Force has experienced some impressive cost efficiencies by procuring initial spares concurrent with production material. Why is the Navy reluctant to adopt this practice?

ANSWER: The Navy has initiated the practice of buying initial spares concurrent with production material. In Fiscal Year 1981 approximately 37% of the dollar value of APN-6 initial procurements were made utilizing this concept. In Fiscal Year 1982 approximately 30% of the dollars were applied under this concept.

QUESTION: Navy estimates that $30 million will be saved in FY-82 from the concurrent procurement of spares with production material for the FA-18 program. Is this savings reflected in the FY-83 submission?

ANSWER: The savings is reflected in the FY-83 submission. The prices utilized in budget formulation reflect the savings offered by the contractor as a result of procuring initial spares concurrent with production material.

QUESTION: Are similar savings in FY-83 expected?

ANSWER: Similar savings are expected in FY-83 and are reflected in the FY-83 submission.

QUESTION: The Administration offered $60 million for the Navy associated with spares and repair parts procurement. Has the perennial "spares problem" improved enough to make this a realistic reduction option?

ANSWER: The Navy currently has a spares procurement problem. The AVCAL restoration program initiated in FY-81 was designed to correct spares deficiencies. The program is spread over the FYDP for affordability and is priced at $1.263 billion. This is the current price of the "spares problem" from prior fiscal years.

AIRCRAFT MISSION CAPABLE RATES

QUESTION: Previous testimony from OSD witnesses indicated that the Navy has established a 70 percent mission capable rate goal for naval aircraft while the Air Force established the higher objective of 75 percent for its aircraft. What is the logic behind the differing standards of performance?

ANSWER: The Navy's mission capable goal of 70% represents the overall level of readiness which will ensure that all mission commitments can be fulfilled. This goal takes into account the fact that many of the Navy's aircraft are maintained aboard ship under crowded conditions with constrained logistics support.

QUESTION: Regardless of the goals established for acceptable aircraft mission capable rates, neither the Navy nor Air Force expect the objectives to be achieved through 1985. Why?

ANSWER: Attainment of the Navy's mission capable (MC) objective is contingent upon full funding of Aviation Depot

Maintenance and related spares requirements and the availability of qualified personnel. Shortfalls in any of these logistics elements will preclude attainment of the mission capable objective.

F-14 TOMCAT FIGHTER

QUESTION: The Navy experienced an average 59 percent mission capable rate for naval aircraft in FY 1981. In part, this average was exacerbated by the performance of the F-14 aircraft which experienced a mission capable rate of less than 50 percent. What factors account for the F-14 readiness status of over 20 percent below the objective?

ANSWER: The mission capable (MC) rate for the F-14 in 1981 was 49.2%, which was short of our objective. Shortages in maintenance manning, in terms of both numbers and individual experience levels, and inadequate component rework funding were two of the major reasons for this relatively poor showing. Solutions to these problems are being aggressively pursued. We are also stressing reliability and maintainability in all F-14 improvements. One indication of the success of this effort is improved MC rates on our newer aircraft. The aircraft procured since 1978 are achieving MC rates ranging from 56.8% to 62.0% in FY 1982.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS)

QUESTION: The Air Force is requesting $52.5 million to develop a JTIDS system using the Time Division Multiple Access technology. The Navy is requesting $100.3 million to develop a JTIDS system using the Distributed Time Division Multiple Access technology. Why are the Air Force and Navy developing separate JTIDS technologies?

ANSWER: In 1976, the JCS specified requirements for both a basic (Phase I) and advanced (Phase II) JTIDS architecture. Because of the Navy's complex and demanding tactical data system requirements across multiple warfare areas (anti-air, anti-submarine, anti-surface and electronic), the Navy needs the multi-functional, multi-netted capability which the advanced Distributed Time Division Multiple Access (DTDMA) architecture provides.

The current Navy Tactical Data System/Air Tactical Data System is limited by the data capacities and lack of flexibility of existing non jam-resistant radios.

The Navy's DTDMA technology, in addition to satisfying the JCS Phase II requirements, is fully backward compatible with and encompasses all the functions and capabilities of the USAF Phase I Time Division Multiple Access (TDMA) terminals.

QUESTION: Do each of your plans include the use of Very High Speed Integrated Circuit (VHSIC) technology?

ANSWER: The Navy's JTIDS program is vigorously supporting VHSIC technology development for DTDMA JTIDS. VHSIC technology, when mature, would be capable of insertion into JTIDS terminals during the production phase. However, any decision to "wait for" VHSIC technology would delay the program up to seven years.

LASER MAVERICK

QUESTION: What portion of the modified fiscal year 1983 request will be spent for the Marine Corps' Laser Guided Maverick?

ANSWER: The Air Force has not requeseted any funding for Laser Maverick; however, the Navy has budgeted $33.1 million in fiscal year 1983 for the Laser Maverick.

PHOENIX LONG RANGE AIR-TO-AIR MISSILE

QUESTION: Considering a unit cost in the range of $2.3 million, can the fiscal year 1983 request for 108 PHOENIX missiles, and 360 in fiscal year 1984, be justified in terms of superior capabilities vis-a-vis less expensive air-to-air missiles? How many of these missiles can we expect to buy over the life of the program?

ANSWER: The unit cost of the PHOENIX in FY 1983 includes non-recurring costs for tooling required to achieve higher rates of production in 1984 and beyond. The recurring cost of the missile in FY 1983, at a low rate of production, is $1.3 million. Unit costs will be reduced to less than a million dollars with achievement of high rate production in FY 1984 and FY 1985.

The PHOENIX is the only air-to-air missile in the inventory with the range, ECCM performance, and multiple shot capability required to defeat the current Soviet threat. We plan to procure over 4500 PHOENIX missiles.

QUESTION: With estimated fiscal year 1983 development costs doubling to over $20 million since last year, is it right to conclude that the PHOENIX R&D program has encountered some unexpected technological problems?

ANSWER: The PHOENIX R&D program has encountered minor technological problems. There have been schedule slips due to normal hardware developmental difficulties, along with under-estimation of the complexity and extent of software requirements. One lesson learned in the Engineering Development Model (EDM) phase was that the original six months planned for Operational Evaluation (OPEVAL) was too short for 15 test launches. The OPEVAL schedule was revised to be 12 months, to begin in October 1982.

The additional time required for EDM deliveries and the stretch-out of the OPEVAL equated to approximately one year of schedule growth, eliminating the remaining schedule reserve. Funds originally planned to begin the OPEVAL in FY 1982 were used at the Navy's Pacific Missile Test Center for flight testing and software refinement to complete the development effort, with no additional development funds going to the contractor.

QUESTION: Inasmuch as operational evaluation of the improved PHOENIX (AIM-54C) should be completed during fiscal year 1983, leading to a decision on full scale producton, will this be a straightforward procurement program from that point?

ANSWER: Yes. The PHOENIX development will be complete except for possible test/re-test requirements resulting from OPEVAL. Production will commence in a high-rate profile until the inventory objective is attained.

VTXTS

QUESTION: We have two requests in the FY-1983 budget for continued R&D on trainers. The Air Force has requested $52.3 million for its new primary trainer, called the Next Generation Trainer (NGT). The Navy is asking $9.7 million for development of a new advanced undergraduate trainer, called the VTX. What initiatives are the Air Force and Navy taking to plan for the common development of future primary and advanced trainers?

ANSWER: The Navy and Air Force signed a Memorandum of Understanding on May 5, 1981 wherein each service agreed to participate in the selection and development of the NGT and VTX in order to ensure that both aircraft are capable of being used by either service. Both services have been participating in the selection and development of both the VTXTS and the NGT.

QUESTION: Will the Navy consider using the Air Force next generation trainer as its primary trainer when it plans to replace the T-34C?

ANSWER: Yes, the Navy will evaluate the Air Force Next Generation Trainer (NGT) as a replacement trainer when the T-34C needs to be replaced.

QUESTION: The GAO found that although the T-34C could be used by the Air Force, it would result in additional flying hours, a longer training cycle and a transition to a jet performance trainer. Do these factors, combined with other costs such as added fuel and O&M, actually make the T-34C more costly than the NGT?

ANSWER: For Navy primary training, the T-34C is the most appropriate aircraft. The Navy's training bases are located, for the most part, in relatively uncongested areas, allowing extensive use of low altitude airspace. Hence, the Navy does not incur the additional sortie length anticipated by the Air Force should it use the T-34C. Unlike the Air Force, a significant number of Navy undergraduate pilot trainees receive their advanced training in lower performance aircraft; multi-engine training in the turboprop T-44, and helicopter training in the TH-57 and TH-1. In view of the Navy's three training pipelines and the availability of the low altitude airspace, the T-34C is considered to be the most appropriate and efficient aircraft for Navy primary training.

QUESTION: If this is so, why doesn't the Navy consider using the NGT to replace the T-34C?

ANSWER: For Navy primary training the most appropriate and cost effective aircraft is the T-34C.

QUESTION: The Navy is requesting $9.7 million in FY 1983 for the VTX advanced trainer. Can you provide a break out of what tasks will be performed with these funds?

ANSWER: The $9.7 million requested in FY 1983 for VTXTS will be spent on technical risk reduction through performance of engine durability tests; plans and programs requirements for DSARC documentation; and Full Scale Development (FSD) requirements including a system Integration Plan, System Safety Plan, Software Development Plan, Cost Analysis Development, Logistic Support planning and a Reliability and Maintainability Plan. Completion of efforts begun in FY-82 on the preparation and review of systems and sysubsystem specifications and Navy in-house expenditures to support the engine tests, analysis of contractual data inputs, and preparation for DSARC will also be funded.

QUESTION: Could completion of pre-full scale development work be done with less than $9.7 million?
ANSWER: No. The $9.7 million requested has been determined to be the minimum amount needed to accomplish the required contractual and in-house efforts in FY-83.

QUESTION: Doesn't the FY 1983 program include preparation and release of a full scale development Request for Proposal (RFP)? If the RFP release were delayed, wouldn't this save funds?
ANSWER: The Navy plans to release a Full Scale Development (FSD) RFP in mid FY-83. The major part of the RFP preparation, specification development, will begin in FY-82 and be completed in FY-83. Through detailed program analysis, a step by step schedule of technical, contractual and legal requirements has been developed which shows that an FSD RFP must be released in FY-83 to allow award of an FSD contract in FY-84. This is required in order to ensure a first flight no later than FY-88. A major revision to this schedule will severely impact the Navy's ability to provide the Training Command with the required quantity of aircraft to replace the current assets as they reach the end of their service life.

QUESTION: The total estimated cost and schedule for the VTX have not been identified. The House Armed Services Committee zeroed the VTX program for these reasons. Why shouldn't this program be cancelled, pending Navy identification of a firm procurement schedule and cost profile?
ANSWER: The total estimated cost and schedule for VTXTS have been identified. This information was recently presented to the House Armed Services Committee staff. The program should not be cancelled.

QUESTION: Why wasn't the VTX program restructured to coincide with the direction of the FY 1982 Appropriations Conference Report, which would continue a competition of two contractors through the end of the pre-full scale development phase of the VTX program?
ANSWER: The McDonnell Douglas system based on the HAWK aircraft offers the Navy the opportunity to structure a more affordable program which will meet its requirements. Continuation of a second contractor in the pre-Full Scale Development (FSD) phase would add approximately 30 million dollars to the FY-82/83 pre-FSD cost with little probability of changing the ultimate result.

QUESTION: Should Congress terminate VTX, how long would it take for the Navy to regroup and come forward with a new program, one which would have firm cost and schedule profiles?
ANSWER: Cancellation of the VTXTS would necessitate developing a new program from Milestone 0. This would entail approval of a new Justification for Major System New Starts (JMSNS), preparation of a new RFP, solicitation for and evaluation of industry proposals, and award of a developmental contract in order to generate firm cost and schedule data. In accordance with established acquisition procedures, it would take approximately three years from program go-ahead to reach the stage of the current VTXTS program.

The VTXTS program has investigated all viable alternatives to meet the Training Command's need through competitive solicitation and evaluation of industry proposals and award of multiple concept development contracts. Schedules and funding profiles have been formulated and will be more detailed and refined for DSARC I scheduled in first quarter FY-83.

QUESTIONS SUBMITTED BY SENATOR RUDMAN

DEPARTMENT OF THE NAVY

AV-8B PROGRAM COST ESTIMATES

QUESTION: You have highlighted the centrality of AV-8B procurement to Marine Aviation's ability to fulfill mission requirements. Certain questions persist, however, which may affect overall procurement levels.

(a) Present AV-8B program cost estimates do not provide for procurement of trainer aircraft, a 25mm gun system and a stretched-out production schedule. When these factors are considered as elements of responsible program cost analysis, by how much is the present estimate understated?

ANSWER: The current plan for procurement of TAV-8B trainer aircraft is structured so that single seat AV-8B's will offset the procurement of TAV-8B's. The new proposed schedule will require a total of 328 vice 336 aircraft of which 27 are TAV-8B's. The savings in procurement cost is approximately $87 million while increases in RDT&E cost is approximately $163 million. Therefore, the net total program increase will be $76 million (3/4 of 1 percent).

The 25mm gun will officially become part of the AV-8B baseline in the 4th quarter of Calendar Year 1982 after the Engineering Change Proposal is approved. Airframe provisions for the gun installation will be funded from the "change allowance" line in the Fiscal Year 1982 procurement and, thereafter, the cost will be identified within the basic AF/CFE line of the budget. The net increase in cost for incorporation of the 25mm system will be approximately $40 million over that amount currently planned in the Five Year Defense Plan (4/10 of 1 percent).

Cost increases associated with production schedule stretch-outs of $200 million have already been identified in the 31 December 1981 Selected Acquisition Report. It is imperative that production rates take advantage of economies of scale and that the positive effect of learning curves be utilized to the greatest extent possible.

AV-8B SURVIVABILITY

QUESTION: Would additional improvements to the AV-8B's survivability be at the expense of aircraft performance?

ANSWER: The AV-8B, by basic design, has impressive inherent survivability characteristics. The small size makes the AV-8B difficult to detect visually, by radar or IR signature. The AV-8B angle rate bombing set is passive. There are no electro-magnetic emissions to provide warning of aircraft approach or a source for a radar homing missile. There is recent public recognition (IEEE Spectrum magazine, April 1982: "Radar: shield or target") that current U. S. radars (A-6; A-7; A-18, e.g.) may give an opponent a decisive advantage by broadcasting the position and makeup of the attacking U. S. forces.

Major technical work to refine survivability enhancement for the AV-8B is ongoing. These studies are examining the effectiveness of various design concepts in reducing aircraft vulnerability by protecting existing components or by adding an additional level of redundancy to certain systems. Concepts being evaluated in trade-off studies include: hydraulic reservoir level sensing, composite push-rods, composite control system bellcranks, redundant stability control cables, dry bay foaming, duplicate engine feed lines, self-sealing fuel lines, self-sealing fuel tanks, gross voided foam in fuel tanks, nitrogen inerting system and engine bay fire extinguisher. Potential enhancements will be measured against cost, weight, performance and program schedule penalties before an implementation decision is made. A major program review will be held in August 1982 to assess the survivability enhancements which are most practical and cost-effective for AV-8B production aircraft.

Although most of these survivability enhancements would require certain adjustments to cost, weight and program schedule, it is envisioned that few would have direct impact on aircraft performance.

AV-8B TRAINER

Question: Would the development of a new trainer for AV-8B pilots be more cost-effective than purchasing existing trainer aircraft?

Answer: As established during the Defense Acqusition Review Council (DSARC II) meeting of July 1979, the initial plans for procurement of the Marine Corps AV-8B force included 24 two-seat trainer aircraft. The original intent was to upgrade the six existing TAV-8A aircraft and to procure 18 additional TAV-8A's. This would provide 24 trainer aircraft within the overall program budget. This increased V/STOL training aircraft capacity is required starting in 1986 when A-4M squadrons commence transition to the new AV-8B. Subsequent events mitigate against procurement of the TAV-8A and favor development of a TAV-8B to meet the V/STOL trainer requirement.

Cost estimates made by British Aerospace for additional USMC TAV-8A's did not include all costs associated with qualifying a weapons system in the United States.

Contrary to expectations, the line at British Aerospace, Kingston, production is devoted entirely to the Sea Harrier, both two seat and single seat variants, which differs considerably from the USMC AV-8A/RAF Harrier. Since the RAF has no plans to reactivate the TAV-8A line or to upgrade the TAV-8A to include AV-8B capability, the considerable cost involved with such an action would have to be borne by the United States. These costs will be discussed in detail later.

A NAVAIR directed study, to determine the possible training transfer from initial training in TAV-8A to subsequent operations in AV-8B, has recently been completed (October 1981). The study indicated that TAV-8A/AV-8B performance and equipment differences far outnumber similarities to an extent not forseeable at the time of DSARC II when the AV-8B was in the early design phase. The AV-8A and B have significantly different concepts (and the associated operating procedures) in cockpit configuration, systems, and handling and flight characteristics. It is important to note that there are over 100 panels, displays, switches, and controls that are unique to the AV-8B which are based on current technology. It follows, therefore, that pilot reactions to abnormal or emergency situations are quite different from those required for AV-8A, thus introducing a possible flight safety compromise.

The NAVAIR analysis results also indicate that there are areas of primary aircraft performance that will be adversely affected by both the identified aircraft differences and associated training transfer process. In fact, the AV-8B and TAV-8A today are entirely different aircraft, even if substantial systems changes are made in the "A" at very high cost relative to the benefits.

Indications are that TAV-8B production cost should be approximately $1 million higher than a single seat AV-8B because an active production line for the AV-8B will be in existance at McDonnell Douglas Aircraft Corporation, St. Louis. Current estimated "fly-away" cost for a TAV-8B is $20.0 million. Conversely, TAV-8A "fly-away" cost is estimated at $31.6 million each on a buy of 18 aircraft. It is important to note that this cost does not include the non-recurring costs associated with improving the TAV-8A performance or upgrading of the existing six aircraft currently in the inventory.

When comparing support costs, the TAV-8B has a clear advantage over the TAV-8A because the TAV-8B commonality with AV-8B spares and support equipment. In addition, the TAV-8A becomes more unattractive because of the continuing requirement to train Marines to maintain a "unique" aircraft through the year 2005, and perhaps beyond. The ability to carry out a "repair of repairables" program on AV-8A parts beyond the year 1990 is highly questionable. The TAV-8A, with a 3,000 hour life, would require a SLEP program, while the TAV-8B aircraft, with a 6,000 hour life, will not.

The TAV-8B configuration offers growth potential for alternative combat mission applications in the 1990's, such as radar attack, reconnaissance, and countermeasures. The TAV-8A has no growth potential for alternate missions.

The TAV-8B configuration offers the best pilot training vehicle to prepare for AV-8B training. If the TAV-8A were used, there will be some "negative learning" encountered due to the difference in cockpit controls, displays, aircraft emergency procedures and flight handling qualities.

AV-8B flight simulators are within the current AV-8B program funding profile reflected in the budget. Delivery of flight simulators to the fleet will be made concurrrent with delivery of the aircraft.

The AV-8B, TAV-8B, and AV-8B flight simulators have identical performance and flight characteristics, and in combination, will provide maximum possible training value at minimum cost.

The Marine Corps has considered the two seat V/STOL trainer requirement for some time. The decision process, including the major considerations outlined herein have always addressed as an area of primary concern, the control of cost growth in the total AV-8B program. From the time of first engineering efforts to the first flight of the AV-8B on 5 November 1981, cost control and schedule goals have been strictly enforced. These efforts have resulted in program achievement of every milestone on or ahead of schedule and within 3 percent of cost goals. It is reasonable to expect that procurement of the TAV-8B would be similarly successful.

AV-8B SUPPORT ISSUES

QUESTION: Critics allege that the AV-8B's ability to perform its mission could be adversely affected by potential maintenance personnel shortages, shipboard space constraints, limited repair capability and inadequate ground support equipment. How is the Marine Corps responding to hedge against these potential pitfalls?

ANSWER: Personnel recruitment, retention and training are not problems unique to the AV-8B program, but are endemic problems with all military services. Marine Corps maintenance personnel requirements have been "tailored" to suit the AV-8B aircraft. The programmed 305 Personnel Table of Organization (T/O) required to support a 20 aircraft AV-8B squadron is 15 less than the total required to support a 20 aircraft AV-8A squadron. This reduction in total structure is possible because of significant reliability and maintainability (R&M) improvements designed into the AV-8B. It is believed that the increased level of reliability combined with reduced levels of maintenance will have a positive effect on peacetime manpower levels.

During the past 12 years of AV-8A shipboard operations, the Navy/Marine Corps has recognized many of the constraints such as maintenance/ordnance space and limited repair capabilities. One of the requirements drawn from this experience is a need to evaluate the optimum mix of AV-8 aircraft and rotary wing aircraft on amphibious ships. A joint CNO/CMC operational test has been developed and is currently being conducted in consonance with a six AV-8A detachment aboard an LHA. Many of the shipboard support and logistics deficiencies are identified during previous deployments and have been corrected. Ongoing and planned improvements to correct other deficiencies are:

1. Ship alterations to amphibious ships which provide landing aids, deck-marking, hangar modifications for maintenance van storage, and ordnance storage.
2. Newly designed ground support equipment and peculiar ground support equipment such as the avionics suitcase test for repairing Weapon Replacable Assemblies (WRA), three point aircraft jacking system, Cobra crane, and engine container and stand which will enhance operations on board ships, as well as land-based operations.
3. Contingency Support Package (CSP) and Independent Deployable Unit Detached (IDUD) pack-ups which will support 40 and six AV-8B aircraft for 90 and 180 days, respectfully.

The Department of the Navy (DON) has already initiated corrective action for providing adequate logistics support and support equipment as evidenced in the 31 December 1981 AV-8B System Acquisition Report (SAR).

TACTICAL AIRCRAFT ISSUES

QUESTION: The Navy reportedly prefers an imaging infrared version of its Harpoon anti-ship missile to development of the MRASM (Medium Range Air to Surface Missile). Although there is a considerable shortfall in range, it is cheaper and lighter than MRASM---so that more could be carried per aircraft. The Navy has been somewhat reluctant to fund its portion of the congressionally-mandated joint development program (with the Air Force). Is the Navy presently re-evaluating its need for MRASM to ensure that adequate funding is provided if the need is reaffirmed?

ANSWER: The highly effective anti-ship HARPOON missile is widely deployed on aircraft, ships andsubmarines. It is in full rate production; and a modest product-improvement effort is underway. HARPOON's range is adequate to keep launch-aircraft outside enemy air defense envelopes and could easily be increased, if necessary. The HARPOON warhead which is also the warhead employed in MRASM designs, is highly effective against ships In addition to HARPOON, the Navy's high-priority TOMAHAWK anti-ship missile--designed for launch from both surface ships and submarines--augments HARPOON within the battle group by providing much longer range and a larger warhead. These two missile programs, each costing several billion dollars and each employing new technology, provide the Navy a world-wide, redundant, anti-ship capability usable by virtually all major fleet units and forces. Thus, an anti-ship MRASM based upon TOMAHAWK technology has been assigned a lower priority than HARPOON by the Navy.

ANTI-SUBMARINE WARFARE

QUESTION: Some $40 billion worth of ASW search aircraft, including P-3C Orions, LAMPS MK III helicopters, and carrier-based S-3 Viking subhunters, could be of little operational utility if the Navy fails to upgrade its array of sonobuoys and their related signal processors. The General Accounting Office has specifically cited the ERAPS (Expendable Reliable Acoustic Path Sonobuoy) and the ASP (Advanced Signal Processor) as being encumbered with many technical problems which are costly and complex. If these modernization programs are not proven to be cost-effective (in terms of incorporating the hardware and software changes needed to make them compatible with subhunting aircraft), might not the entire usefulness of our ASW aircraft fleet be severely compromised?

ANSWER: Yes, should these modernization programs prove not to be cost effective and subsequently cancelled, the ability of our ASW aircraft to perform their mission would be adversely affected. However, we view the ERAPS and ASP modernization programs not only cost-effective, but essential to ensuring the preeminence of our ASW aircraft against the emerging threat. The Navy's response to the GAO report addressed convincingly the issues raised by GAO and acknowledged that the discovery of technical discrepancies are normal in a developmental program; in fact, that is one objective of research and development projects. However, none of the discrepancies were found to be so costly or complex as to jeopardize the continuation of either of these critical programs.

ERAPS is admittedly the most costly and complex project in the Air Acoustic Systems Development Program (DCP-96). Its mission is to perform in the critical localization, attack and reattack phase of ASW prosecution and is designed for use against both quiet nuclear and diesel-electric submarines. GAO correctly stated that ERAPS was not compatible with current Air ASW processors; ERAPS, however, is designed to be compatible with ASP. So the compatibility issue really rests with whether ASP can be successfully incorporated in existing and future ASW aircraft.

ASP is the selected acoustic signal processor for the LAMPS III (aircraft and ship), P-3C Update III, S-3B WSIP, SURTASS, SQR-19 TACTASS, SQS-53 Sonar Improvement and SSBN Sonar Improvement. P-3C Display/Control and the Air Force MGT

System utilize ASP derivatives. As an embedded system, all technical and operational evaluation, procurement and fleet introduction is accomplished by ASP user programs. Three user programs (SURTASS, P-3C, and LAMPS III) have employed ASP as an embedded system in technical and operational evaluation with a high degree of success in performance and reliability. Four other user programs will commence technical and operation evaluation within the next year.

With regard to its effectiveness, ASP provides a major improvement in performance and reliability over any other acoustic processors currently in the fleet, being delivered to the fleet, or available for full scale development efforts. Because of ASP's extraordinary growth potential, it has been selected as a candidate for VHSIC (Very High Speed Integrated Circuit) "technology insertion" with a significant improvement in processing capability. As for costs, the development of ASP under a single program, with common hardware and software, yields an estimated savings of $15 to 30 million per user (measured against costs for each user to develop ASP independently). Furthermore, approximately $400 million in savings accrues to the single production procurement strategy derived primarily from consolidating support requirements.

While there are still routine technical problems to overcome in both programs, there exists no question on the part of the Navy of the cost-effectiveness of either ERAPS or ASP. These two programs are the cornerstones of the Navy's airborne ASW effectiveness in the future.

F/A-18

QUESTION: In addition to long-standing criticisms of cost and lack of an adequate logistics base, including delays in delivery of test equipment and pilot training devices, which have plagued the F/A-18 program, a recent Congressional Budget Office report says that beyond ranges of about 300 nautical miles, the aircraft loses much of it supposed efficiency. This is a crucial allegation if, as Navy doctrine proposes, carrier battle groups might have to "go in harm's way" and operate within striking distance of the Soviet Union's heavily defended ports. How does the Navy respond?

ANSWER: The Congressional Budget Office report states, "The primary measure of the effectiveness of an attack force is the number of pounds of ordnance it can deliver to a target area during an operating period. Other important considerations are how survivable it is in a hostile environment and how reliable and maintainable the aircraft are, since these factors affect the long-term capacity of the force for ordnance delivery" (page 33). The report continues, "The Navy's preferred force would have a capacity to deliver bombs about 20 percent greater than that of the current force, at ranges up to 500 nautical miles from the carrier." The report considers strike warfare from a limited perspective, i.e, the ability to carry a quantity of ordnance to a target area. In the real world, carrier strike warfare is much more complex. It is not possible to remain outside the range of Soviet fighters as suggested, if one is to attack the very bases from which Soviet fighters fly. Attack aircraft committed to such a venture would experience nearly 100% attrition without fighter escort. Fighter escort is mandatory. Neither is it possible for the carrier to remain outside the radius of Soviet long range naval aviation forces. No matter what the carrier standoff distance, a large portion, if not all, of the F-14 force must be committed to task force defense.

The realistic combat radius of either the F-14 or the fighter configured F/A-18, in the postulated environment, is much less than the range at which the Navy's preferred attack force has 20 percent greater capability than the current force. Viewed from a realistic operational perspective, the Congressional Budget Office report leads to an endorsement of the Navy's preferred force which includes the multi-mission F/A-18.

QUESTION: Might it not be more cost-effective to alter the Navy's preferred mix (of F/A-18s and F-14s) and procure greater numbers of A-6Es (which have superior capability at medium ranges of 300-600 nautical miles) or the A-7X (re-engined) which some analysts maintain would have a comparable capability to the F/A-18 at lower cost?

ANSWER: The F/A-18 multi-mission flexibility is the key element in a Commander's ability to structure the day-to-day capability of his force to meet the threat and accomplish offensive objectives. The A-6E has no fighter capability, and the A-7X has, as a design objective, less fighter capability than the F-8, the predecessor to the F-4. The F/A-18, on the other hand, is clearly superior to the F-4 in every respect and at least the equal of the F-14 in the fighter escort mission.

These essential facts do not affect the Congressional Budget Office report because of stated limitations to the scope of that study. In addition to the versatility offered by the F/A-18, the report states that it increases the attack capability of the current force to ranges (500 miles) beyond realistic fighter escort ranges.

Consideration of the F/A-18's attack capability while ignoring its fighter capability, or alternatively, consideration of its fighter capability alone, does not lead to a logical conclusion. The F/A-18 is the key to the flexibility of the Navy's preferred carrier aircraft mix; it both doubles the number of potential fighters aboard ship and increases attack effectiveness to ranges beyond the capability of fighter escort aircraft.

QUESTIONS SUBMITTED BY SENATOR STENNIS

DEPARTMENT OF THE AIR FORCE

REDUCTION DUE TO CONSOLIDATION OF THE CRUISE MISSILE

QUESTION: General Burke, the Department recommended recently that $43 million could be reduced from the Air Force FY 1983 budget to consolidate cruise missile programs. Does this have anything to do with the joint development with the Navy of the Medium Range Air-to-Surface Missile (MRASM)?

ANSWER: The FY 1983 budget reduction for cruise missile programs was not targeted at any particular cruise missile program. The Air Force and OSD are currently reviewing all cruise missile development efforts to ensure a coordinated and coherent program. A determination of what programs will be affected by this reduction has not been made.

IMPROVED CAPABILITY AT SUBSTANTIAL SAVINGS

QUESTION: Would you give us your opinion of how effective the joint development programs with the Navy are and whether you believe programs of this nature have provided for improved capability at substantial savings?

ANSWER: When the USAF and USN requirements for a particular type of system are comparable, then joint development programs offer substantial savings and operational benefits. In the case of USAF and USN fighter aircraft where significant differences exist in basing concepts, operating conditions and mission priorities, joint development of the total system can ultimately penalize both services. However, joint development can be useful on common subsystems, such as the engine.

To be effective, joint program requirements must be compatible with respect to system function, need date or schedule, and priority for funding within each service. In such cases, a joint development program is clearly in the best interests of the Department of Defense.

F-15/F-16 COMPARE WITH F-111

QUESTION: Your statement mentions that the F-111 force is fully committed and attriting. How short of these aircraft are we? How do the air-to-surface capabilities of the F-15/F-16 compare with the F-111?

ANSWER: We bought 455 F-111s beginning in 1968 and now have 240 combat coded aircraft remaining in our fighter force. The F-111 force size has been reduced through normal attrition and conversion to EF-111s. As the F-111 force continues to reduce in size, we plan to relieve their wartime tasking by introducing an F-15/F-16 derivative to insure we are not "short" of aircraft performing the F-111 type role.

As the Air Force's primary air superiority fighter, the F-15 does not presently have an air-to-surface mission. However, it has demonstrated a visual air-to-surface capability comparable to the F-16 and A-7. Both the F-16 and the F-111 can precisely "put the bombs on target"; however, the F-111 can carry more ordnance over a greater range and accurately attack targets at night and in adverse weather conditions.

AVERAGE ANNUAL OPERATION COST OF F-106 COMPARED WITH F-15

QUESTION: The aging F-106 squadrons are being replaced with F-15 aircraft. It would appear that savings should accrue in the annual operation cost. Can you tell us the average annual operation cost of the F-106 squadrons as compared with the F-15?

ANSWER: Based upon typical squadrons of 18 aircraft, the average annual operation cost of an air defense F-15 squadron is $44M (FY 82 $) versus $34M (FY 82 $) for an F-106 squadron. However, the F-15 is a significantly more capable two-engine aircraft versus a single engine F-106. Thus, F-15 fuel consumption and materiel maintenance costs are higher.

SATISFACTORY LEVEL OF AIRCRAFT BEING OPERATIONALLY CAPABLE

QUESTION: Your chart on spare parts funding indicates that the peak funding is achieved in FY 1982 and then will start to decrease. Are you satisfied that our inventory has reached the point where a reduced level of funding can be accommodated and still maintain a satisfactory level of aircraft being operationally capable?

ANSWER: The FY 81 Supplemental and FY 82 Budget contained large expenditures for spares that were required to reduce the shortages of aircraft spare parts that reflected substantial underfunding of these accounts in previous years. Having significantly reduced this backlog, the funding for spares in FY 83 is less than that required last year and will keep our aircraft mission capable. The Air Force is strongly committed to full funding of our spares requirements.

LANTIRN FOR F-16 & A-10 AIRCRAFT

QUESTION: The Air Force is moving toward development of a low altitude navigation and targeting infrared system for night (LANTIRN) for both the F-16 and A-10 aircraft. Would you comment on how these development programs are progressing and the improvement in operational capability which this modification will provide?

ANSWER: The LANTIRN development is proceeding satisfactorily. Hardware critical design reviews have been successfully completed for the LANTIRN navigation pod, targeting pod, and Head-Up Display (HUD).

Flight test of the terrain following radar in a contractor aircraft testbed was accomplished Mar-May 1982 and flight test of the HUD is planned to begin Jul 1982 as scheduled. The pod flight test start remains scheduled for Jul 1983, based on successful test results to date of breadboard and brassboard hardware for major subsystems.

The improvement which LANTIRN provides in operational capability encompasses the full realm of low altitude night precision attack with single seat aircraft. LANTIRN will enable single seat aircraft to be flown low altitude over varying terrain at night with an effective capability to acquire and attack targets. Current single seat aircraft have virtually no capability to perform these functions at night.

TECHNICAL AND SCHEDULE RISKS HAVE BEEN RECOGNIZED

QUESTION: A number of shortcuts have been taken in this development program. Is the Air Force satisfied that all technical and schedule risks have been recognized and that the restructured program is technically achievable within the estimated costs?

When is a formal OSD review of the program planned?

ANSWER: The LANTIRN program was restructured in Jun 1981 for the very purpose of reducing risk and insuring that integration and check-out of all subsystems would be accomplished prior to flight test.

Results to date from hardware critical design reviews and subsystem tests support Air Force confidence that technical and schedule risks have been recognized in the restructured program. In addition, cost performance to date has been as projected and provides further basis for remaining convinced that the program is technically achie able within estimated costs.

A formal OSD review of the program is not planned because LANTIRN is not specified as a DSARC program.

WORKLOAD ON A LANTIRN MISSION

QUESTION: Are actions being taken to ensure that pilots are capable of performing the workload on a LANTIRN mission using manual terrain-following radar and forward-looking infrared sensor at low altitudes?

ANSWER: A single seat night attack workload evaluation is planned to be conducted on an A-10 beginning Jul 1982 to investigate pilot workload associated with manual terrain-following radar and forward-looking infrared sensor at low altitudes. The results of that flight test will be applied to LANTIRN in preparation for the LANTIRN flight test scheduled to begin Jul 1983.

In addition to near-term plans for evaluating pilot workload, the LANTIRN system is being designed so that it can provide aircraft inputs for automatic terrain following (avoidance).

EFFECTIVENESS OF LANTIRN

QUESTION: Is it your opinion that the effectiveness of LANTIRN will have to be reassessed in view of doubts about the pilots' ability to perform at low altitudes?

ANSWER: The doubts expressed in the GAO report on LANTIRN dated 5 Mar 82 were related to concern about workload when using manual terrain following during high speed, low altitude attack. The LANTIRN system is now being designed to employ either automatic or manual terrain following (avoidance) and changes to the F-16 aircraft to incorporate automatic terrain avoidance are anticipated by the time of LANTIRN flight test.

While the LANTIRN cost effectiveness study highlights the effectiveness of LANTIRN even with manual terrain following, the incorporation of automatic terrain avoidance for the F-16 improves that effectiveness even more.

DELAYING THE HEADS-UP DISPLAY PRODUCTION

QUESTION: Production of the LANTIRN Heads-Up Display for the A-10 aircraft is scheduled to begin in December 1983, but production of the associated fire-control system pods will not begin until many years later. Has the Air Force considered delaying the Heads-Up Display production until closer to production of the fire-control system pods?

ANSWER: The Air Force has carefuly evaluated schedules for production of the LANTIRN Heads-Up Display (HUD) built by Marconi Ltd and determined that an A-10 HUD production buy beginning early FY84 is both appropriate and cost effective.

By buying Marconi HUD's in early FY84, the Air Force can cancel plans to buy 176 HUD's which are otherwise needed for A-10 aircraft being modified with an inertial navigation system. Cost of the Marconi HUD is comparable to the current A-10 HUD;

consequently, a timely buy of the Marconi HUD results in considerable savings by preserving negotiated production options and avoiding unnecessary redundant buy of the current A-10 HUD.

COST INCREASES IN LANTIRN

QUESTION: In view of the cost increases on LANTIRN, do you still believe this system is cost effective for both the F-16 and the A-10 aircraft?

ANSWER: A study by Air Force Studies and Analyses office was recently updated to consider the latest LANTIRN costs and additional configuration variation. This study, which has been reviewed and approved for publication, concludes that LANTIRN remains cost effective for both the F-16 and A-10 aircraft.

40 TACTICAL FIGHTER WINGS ACHIEVABLE

QUESTION: The force structure is scheduled to increase to 40 tactical fighter wings by 1985. The current buy of aircraft is just over 200 and the annual procurement goal of 280 fighter aircraft will not be reached until FY 1986. With attrition built in, is this goal of 40 Tactical Fighter Wings achievable?

ANSWER: The goal of reaching 40 Tactical Fighter Wings by 1985, is achievable at planned procurement rates. To reach this goal, the Air Force must retain older fighters as newer generation aircraft are brought on board; this will, in turn, increase the average age of the fighter force.

AVERAGE AGE OF FIGHTER ATTACK FORCE

QUESTION: I am surprised at your chart of the average age of the fighter attack force. Should this not be coming down with the F-4 and F-106 coming out of the active force?

Will your projected procurement goal of 280 fighter aircraft by 1986 lead to the average age coming down by the end of the century?

ANSWER: The average age chart reflects the force ~~age~~ until 1987, at which time there will still be some 45 F-106s (avg age 27 yrs) and more than 700 F-4s (avg age 20 yrs) in the fighter/attack force. Furthermore, we have reluctantly allowed the force to age in order to build to just over 40 TFW's by 1987.

Procurement of 280 A/C per year will allow us to sustain our force and build to our authorized 44 TFW level by 1990, while maintaining the average age at about 10.5 yrs. It should be noted, however, that this procurement level addresses only the tactical force structure and does not include other mission areas such as reconnaissance, strategic air defense and tactical control elements.

ADVANTAGE TO THE FORMER F-15 AIRCRAFT

QUESTION: The flyoff of the F-15E and the F-16E for the dual-role fighter/interdiction aircraft role is approaching. The F-15 Strike Eagle demonstrator has been flying since 1980, while F-16E is schedule to start flight testing this summer. Does this give advantage to the former aircraft with the substantial testing behind it?

ANSWER: The F-15 Strike Eagle demonstrator has been flying as an avionics test bed as part of an Independent Research and Development (IRAD) effort using MacDonnell Douglas funds. The information generated is not of the type required in the comparative demonstration, which is a range-payload evaluation. The Air Force will still have to flight test the aircraft, along with the F-16E prototype, to verify expected systems performance.

COMMENT ON ENHANCED AIR-TO-GROUND CAPABILITIES

QUESTION: Would you comment on the enhanced air-to-ground capabilities, as well as continuation of the existing air-to-air capability which you hope to achieve in this dual-role aircraft?

ANSWER: Both derivatives (F-15E and F-16E) offer significant improvements in range-payload and in night under-the-weather capability, and retain their excellent air-to-air capabilities.

The F-15E will have missionized front and rear cockpits with multifunctional displays for the air-to-surface mission. A Terrain Following/ Terrain Avoidance (TF/TA) capability will be provided through the LANTIRN system. Software changes to the Programmable Armament Control Set (PACS) and an avionics multiplex bus system will provide control functions for conventional and nuclear weapons at five air-to-surface weapons stations.

The F-16E will have a missionized rear cockpit and will retain high commonality with the F-16A fuselage. It will include Multinational Staged Improvement Program (MSIP) Stage III avionics. This includes an improved radar with air-to-air and air-to-surface enhancements, TF/TA capability and precision location strike system/ global positioning system.

The air-to-air capability of both aircraft will be increased with the addition of AMRAAM.

DEPARTMENT OF THE NAVY

A-6E

QUESTION: Admiral McDonald, the Secretary of Defense recently concluded that no funds were required for procurement of A-6E aircraft in FY 1983 and the production line should be closed. The Commandant of the Marine Corps, General Barrow, feels additional production is required as "This aircraft, with its fine all-weather capability, is the ground commander's most reliable attack vehicle at night and during periods of reduced visibility." Would you discuss the thinking of the Navy which led to this decision by Secretary Weinberger?

ANSWER: The Navy supports continued procurement of the A-6E aircraft. However, recent efforts to reduce the FY 1983 Defense budget prompted consideration of all Navy aircraft procurement programs, from the standpoint of possible termination; out of this review came the decision to terminate A-6E procurement. This difficult choice was based on economic considerations and not on a lessening of the threat or requirement. Without additional A-6E procurement, the Navy will have to restructure the A-6E force commencing in FY 1987 and procure other derivative TACAIR aircraft to fulfill Navy and Marine Corps all-weather mission requirements.

QUESTION: Does the Navy have an aircraft in mind to replace the A-6E?

ANSWER: A replacement aircraft for the A-6E has not been identified. If A-6E procurement is terminated in FY 1983, an urgent need for a replacement will be required by the late 1980's. A potential follow-on replacement is an A-6F configuration using the A-6E TRAM as the baseline aircraft. The Navy plans to initiate an assessment of an A-6F aircraft in parallel with the A-6 STOL demonstration program.

QUESTION: What has changed since submission of the FY 1983 budget in January that the eight aircraft at a price of $230 million will no longer be required?

ANSWER: The requirement for additional A-6E procurement has not changed. Termination of A-6E procurement was based solely on economic considerations and should not be interpreted as a reduction in all-weather mission requirements.

QUESTION: The Senate Armed Services Committee believes that the Navy has an excess of A-6E aircraft. Would you comment on this?

ANSWER: The excess inventory of A-6E's referred to by the Senate Armed Services Committee exists in two categories: a group of older A-6E's in storage which are identified for conversion to the KA-6D configuration to support tactical aerial refueling requirements and a second group in which the aircraft are programmed for wing replacement or conversion to the A-6E TRAM configuration. This excess is only temporary and additional procurement is required to achieve inventory levels required to sustain the current A-6E force and stand up the fourteenth airwing in FY 1987.

QUESTION: The Senate version of the authorization bill provides for the Marines to replace their A-6E aircraft with attack and fighter versions of the F/A-18 aircraft. What would you think of this?

ANSWER: The A-6E is the only aircraft in the inventory that fulfills the Marine Corps' all-weather, close air support mission requirements. There are no plans or funds assigned to upgrade the F/A-18 to the all-weather capability of the A-6E. While a derivative of the TF/A-18 might be feasible as a replacement in the Marine all-weather close air support role, this concept has not been evaluated.

AV-8B TRAINER REQUIREMENTS

QUESTION: The Navy plans to procure 18 additional AV-8A trainer aircraft for the training of AV-8B Harrier II pilots. It is my understanding that the AV-8A production line is no longer in operation and spare parts and components are limited. What are the benefits of developing and producing an AV-8B trainer aircraft rather than procuring additional AV-8As?

ANSWER: As established during the Defense Acquisition Review Council (DSARC II) meeting of July 1979, the initial DON plan for procurement of the Marine Corps AV-8B force included 24 two-seat trainer aircraft. The original intent was to upgrade the six existing TAV-8A aircraft and to procure 18 additional TAV-8As. Contrary to expectations, the TAV-8A line was discontinued at the British Aerospace Facility, Kingston. Since the RAF has no plans to reactivate the TAV-8A line, the considerable cost involved to reopen the line would have to be borne by the United States.

The TAV-8B configuration offers the best pilot training vehicle to prepare for AV-8B training. The TAV-8B configuration offers growth potential for alternative combat mission applications in the 1990s, such as radar attack, reconnaissance, and countermeasures. The TAV-8A has no growth potential for alternate missions.

QUESTION: Has the issue been studied to determine the costs associated with purchasing and maintaining each trainer aircraft?

ANSWER: The draft of a proposed report by the U. S. General Accounting Office (GAO), AV-8B Harrier II Program, dated 14 December 1981, contained the following statement:

> "Preliminary Navy cost estimates indicate that the cost of procuring 18 new TAV-8As and extending the service life of the existing 6 TAV-8As would be $667.3 million while the cost of procuring 24 new TAV-8Bs would be $722.5 million. The TAV-8B cost estimate includes the cost of research and development; however, the TAV-8A estimate does not include the costs associated with retooling and restarting the production line."

QUESTION: What impact would the development and production of an AV-8B (Trainer) have on the Harrier II (AV-8B) total program cost and schedule?

ANSWER: None. We intend to fund the TAV-8B development and procurement costs from within the total 336 aircraft budget. This, of course, assumes sufficient procurement rate to provide this flexibility while the light attack shortfalls are satisfied. If the procurement schedule stretchout is not arrested, the AV-8B program flexibility to reprogram APN dollars to RDT&E dollars will not be available. The trade-off of single seat AV-8Bs for two seat TAV-8B aircraft is expected to result in a net of 6 less total aircraft.

F/A-18

QUESTION: What is the status of the study to reduce the quantity and cost of automatic test equipment supporting the F/A-18 aircraft?

ANSWER: That study has now been completed. It showed that multi-port Automatic Test Equipment is a viable option. A dual-ported Radar Test Station (RTS) has been approved. The multi-port Avionics Test Set (ATS) also offers potential savings, but it competes for initiation with other program requirements.

QUESTION: Why does the Marine Corps need an intermediate maintenance capability for these avionics and radar components?

ANSWER: The Marine Corps' primary function is deployment/employment of a highly integrated mobile combat capability. To perform this function and provide mission capable aircraft it is absolutely essential that the Marine Corps have an organic deployable intermediate maintenance repair capability for F/A-18 avionics and radar components.

In modern mobile warfare, even short support pipelines are difficult to establish and protect. Yet for today's sophisticated aircraft a continuous flow of spare parts is essential if any level of mission capability is to be maintained. Organic intermediate repair, for essential F/A-18 avionics and radar components, provides Marine Air Groups the ability to shorten precarious supply pipelines to minimum distances and provide maximum utilization of existing spare components during peacetime.

The alternative is to procure a very high remove and replace level of spare parts and provide an uninterrupted pipeline flow. This requires a large investment in additional spares (which would not be utilized in peacetime) and the assets necessary to establish and protect long supporting pipelines.

QUESTION: The current plan appears to be for each squadron to have 12 F/A-18 aircraft. Wouldn't it be possible for personnel and support equipment costs to be reduced if the Navy consolidated squadrons into units of 24 F/A-18 aircraft?

ANSWER: Consolidation of existing squadrons into 24-plane units does offer some marginal reduction in personnel and support equipment costs. These potential reductions, however, are far outweighed by the operational disadvantages of such a consolidation.

QUESTION: I believe the Center for Naval Analysis was looking into this matter. What were their findings?

ANSWER: The Center for Naval Analyses has completed a study which recommends consolidaton of two A-7 squadrons for further evaluation of the feasibility of this concept. It is the Navy position, having considered this issue over a period of years, that while increasing squadron size might offer a small cost benefit, it reduces employment options to an unacceptable degree.

QUESTION: What are the pros and cons of operating 24 aircraft-size squadrons on a carrier as opposed to a land-based unit?

ANSWER: Squadron size for carrier-deployed units, and for Marine Corps units ashore, is determined by economic and effectiveness measures. Given the variety and complexity of tasks facing Navy and Marine Corps tactical commanders, the division of tactical air assets into 12-aircraft squadrons provides the best balance between operational flexibility and economic management.

QUESTION: The GAO has reported that development of a number of test program sets for use with automatic test equipment has been deferred. This would appear to decrease the Navy's capability for shipboard testing and increase turnaround time for aircraft components. Is this true?

ANSWER: Yes, but there are more cost-effective means of achieving the same readiness levels. When reliability of parts has been demonstrated to be high, it is more cost-effective to buy spares to replace an occasional failure than fund the development of expensive test program sets (TPS). Training proficiency also becomes a problem when technicans are asked to repair a part at infrequent intervals. The justification for deferring development of TPS's is to confirm the projected reliability of individual repairable parts, and to analyze the most cost-effective method of providing the required readiness levels.

QUESTION: Will the decreased testing capabilities have an effect on aircraft readiness?

ANSWER: No. For those repairable parts for which the decision to spare or develop TPS's has been deferred, initial spares are procured in sufficient numbers to support pessimistic reliability statistics until the reliability has been confirmed. The decision to spare or develop TPS's has been made for all repairable parts on the F/A-18; however, if parts reliabilities deteriorate, TPS's can be developed, which would then permit testing to be performed aboard ship if required.

QUESTION: When will the full testing capability be fully operational and available for installation on the carriers?

ANSWER: The present maintenance plan does not reflect 100% testing of all repairable parts aboard ship. Some high reliability parts will be repaired at the depot or at a Selected Intermediate Maintenance Activity.

QUESTION: What would be the cost to accelerate the development of testing equipment and test program sets as compared with the cost of additional spares which would be required as a result of the lack of full testing capability?

ANSWER: Most repairables can be tested on the Automatic Test Equipment that is being procured and the cost of acceleration of TPS development is difficult to project. However, in 1978 a Level of Repair Analysis (LORA) was conducted to determine whether it was more cost-effective to buy spares and repair at the depot or develop TPS's and repair aboard ship. Common sense indicated that some repairables should be added to the LORA, and the current maintenance plan reflects an 8% increase over the LORA as a result of adding some repairables. If all repairables were sent to the depot for repair, the cost would be 36% greater, and if TPS's were developed for all repairables, the cost would be 26% higher.

QUESTION: The first weapons tactics trainer units will only have the capability to simulate air-to-air combat. When will these units have the capability to train Navy and Marine Corps pilots in air-to-ground and electronic counter-countermeasure warfare?

ANSWER: The air-to-ground and electronic counter-countermeasure (ECCM) capability modification for the first WTT is programmed for FY-83 for delivery in CY-87.

QUESTION: What is the feasibility of having this training in the operational flight trainer?

ANSWER: The current configuration of the operational flight trainer (OFT) provides for basic flying qualities, normal and emergency system operations and procedures, instrument and basic navigation with field and carrier take-offs and landings. The OFT possesses very limited weapons system capability - a manual release mode only. The OFT visual system is a narrow angle, small field-of-view VITAL IV computer-generated image projected on a CRT. It is adequate for instrument training, basic navigation, and night/dusk field/carrier landing training.

To incorporate an air-to-ground and electronic counter-countermeasures system into the OFT would require incorporation of:

(1) A much larger visual system capable of providing adequate real world day/night images for ground gaming area, wide angle field-of-view, visual threats, and higher visual image resolution and brilliance than that required for an air-to-air visual system.

(2) A digital radar land mass system (DRLMS) including radar ranging for weapons delivery. (This capability does not exist in WTT air-to-air system; it will have to be added to OFT or WTT.)

(3) A weapons delivery avionics system and associated simulation software to provide for air-to-ground weapons capability. The OFT cannot recognize external stores, system modes, and aerodynamic characteristics associated with external weapons.

QUESTION: What are the cost implications of providing this training in the weapons tactics trainers as opposed to the operational flight trainer?

ANSWER: To modify an existing Operational Flight Trainer to include air-to-ground and electronic counter-countermeasures is estimated to cost $15-20 million, including the first device non-recurring costs.

To develop a new OFT with air-to-ground and ECCM capabilities is estimated to cost $25-30 million, including first device non-recurring costs.

The estimated cost to develop an air-to-ground and electronic counter-countermeasures training capability for the weapons tactics trainer is $20.3 million.

QUESTION: At the Defense System Acquisition Review Council (DSARC) in March 1981, the Navy presented a number of initiatives for reducing the cost of the F/A-18 program. Would you provide for the record the measurable cost savings or avoidance for each of those initiatives to date and the potential savings and/or avoidance?

ANSWER: Status of F/A-18 cost reduction initiatives follows:

o Breakout of Contractor Furnished Equipment: Key items are being reviewed for the feasibility of breaking them out from McDonnell Douglas and Northrop. To date, six items have been identified as feasible for breakout in FY 1983. An extensive list is under review for possible breakout in FY 1984. The Navy has not completed the pricing analysis related to the breakout initiatives. However, the potential savings associated with the breakout initiative are greater than $500 million. Every item broken out from McDonnell Douglas will save about 12.5%. At Northrop, the savings will be approximately 40% for each item. These savings are tempered, of course, by the added cost of administration and the added burden on NAVAIR of responsibility for timely delivery of acceptable GFE.

o Second Sourcing: The F/A-18 Cost Reduction Management Working Group (CRMWOG) is completing a definitive study of second sourcing the ASN-130 inertial guidance system. The preliminary estimate of the potential cost savings from this item alone is $20 million. Total potential savings from second sourcing exceeds $140 million.

o Multi-Year Procurement: The current plan is to commence multi-year procurement on the F404 engine in FY 1984 and on the airframe in FY 1985. However, the President's FY 1983 Budget submittal does not reflect the initial financing requirements and will have to be adjusted during the Congressional mark. Anticipated savings are in the 5% to 10% range.

o Maximum Progress Payments: In the FY 1979 and FY 1980 contracts, contract financing was used to obtain a lower price from the prime contractor through maintenance of a net profit rate. It was recognized that a better cash flow than that normally provided in DOD contracts could be used as an incentive. At the F/A-18 fighter DSARC, it was proposed to use financing as an inducement to get the contractor to accept a greater share of the risk under the contract. This was accomplished in the FY 1981 negotiations. While it seems realistic to assume that the pressure of greater risk will provide incentive for the contractor to work harder to hold down cost, and thus reduce outyear program costs, it cannot be quantified as could a reduced profit rate.

o Spares Acquisition Integrated With Procurement (SAIP): The F/A-18 Program Review Decision Memorandum of 29 June 1981 authorized the use of SAIP in those situations in which it is economical and meets system readiness objectives. The Aviation Supply Office and McDonnell Douglas are currently working on the details of language to be included in a Basic Ordering Agreement which would implement SAIP on 12 systems for FY 1982 and FY 1983. The overall savings potentially resulting from SAIP exceed $250 million.

o Economic Production Rates: The economic production rate for the F/A-18 should balance optimum rate from the contractor's perspective with naval operational requirements. The economic rate is a function of the contractor's business base, including FMS. Canada has contracted with McDonnell Douglas for 138 aircraft. Benefits to the U.S. Navy of this sale were included in the President's FY 1982 Budget submittal. On 20 October 1981, the Government of Australia announced its intent to purchase 75 aircraft. The resultant benefits to the U.S. Navy from the Australian procurement have been included in the President's FY 1983 Budget submittal and are estimated to be in excess of $300 million.

o Production Modernization: Enhanced factory capital investment in more productive technology was identified at the DSARC review as a major cost reduction initiative. NAVAIR has initiated a Phase I Technology Modernization study at Hughes and Northrop. The program began in May 1982. The potential savings from these two programs alone is over $500 million. In addition, similar programs are being considered for McDonnell Douglas and General Electric.

QUESTION: The first F/A-18 carrier deployment is scheduled for 1985. Some carriers will have four F/A-18 squadrons - two fighter squadrons and two attack squadrons.

Does the budget request provide funds for sufficient equipment and spares to support these squadrons?

ANSWER: Yes, each ship will be provisioned for the number of squadrons aboard.

QUESTION: Is shipboard space available for the equipment and spares which are required to support and operate the F/A-18s as either fighter or attack aircraft?

ANSWER: Yes. There will be less space required to support two F/A-18 fighter squadrons and two F/A-18 light attack squadrons than is required to support two F-4 fighter squadrons and two A-7E light attack squadrons.

QUESTION: Is it your opinion that the F/A-18 production schedule is compatible with the scheduled carrier refurbishment plan?

ANSWER: Yes, F/A-18 procurement was planned considering many factors, among them, carrier schedules.

QUESTION: The full-scale development test program for the F/A-18 was to be completed in April 1982. Has this, in fact, been completed?

ANSWER: A Technical Evaluation (TECHEVAL) was completed during March 1982, which concluded that the F/A-18 was ready for Operational Evaluation (OPEVAL); however, there are several low risk tasks remaining to be completed in FY 1983 when additional RDT&E funding is made available. The FY 1983 development program was restructured to accommodate the $35 million reduction in requested funds.

QUESTION: There were a number of technical problems experienced during the full-scale development program. Have all the required changes been incorporated and flight tested?

ANSWER: All significant development problems have been corrected and verified by Navy test pilots.

A-6E PRODUCTION

QUESTION: General WHITE, what is your opinion of the recommendation by the Secretary of Defense to close the A-6E production line?

ANSWER: The current A-6 inventory will only sustain Navy and Marine requirements until approximately 1987. Since the Marine Corps has a well defined requirement for all weather close air support and interdiction, I oppose any initiative that would remove the A-6E aircraft from the Marine Corps inventory before an equally capable or improved weapons system is available. This is also the feeling voiced by the Commandant of the Marine Corps in letters to the Chairmen of the Armed Services and Appropriations Committees.

MARINE CORPS A-6E'S

QUESTION: What about the recommendation by the authorization bill to transfer the Marine Corps inventory of A-6E aircraft to the Navy, which would be replaced by F/A-18 aircraft?

ANSWER: The Marine Corps is opposed to the transfer of the A-6E inventory to the Navy; however, we are prepared to consider replacing the A-6E with an enhanced F/A-18. I must note that the current single seat version is not an adequate A-6E replacement. We believe that the F/A-18 has the potential to become a suitable all weather attack platform but it needs two seats and substantial software changes to attain that capability.

The timing of the A-6E production line closing and the development of a satisfactory all weather attack replacement is critical. We have been looking at three options:

a. The VFMX which has an IOC in the late 1990's.

b. The A-6F which could be delivered by 1991.

c. An enhanced F/A-18 which I estimate will take a minimum of five years from the time it is funded.

If the A-6E production is terminated in FY83, the Marine Corps will need a replacement by 1987. Since none of the candidate aircraft are currently programmed, I am concerned that the Marine Corps will suffer a loss of capability between FY87 and the delivery of an A-6E follow on.

AV-8B COSTS

QUESTION: General White, how does the cost of the AV-8B compare with those of other aircraft?

ANSWER: Senator, a cost comparison can be made by considering Fiscal Year 1983 and beyond and by using the data contained in the Fiscal Year 1983 President's Budget Estimate Aircraft Data Sheets. A true measure of the cost comparison can readily be seen by using Unit Weapons System Cost. The comparison is as follows:

F-14A	$64.2 million
A-6E	$31.3 million
F/A-18	$24.9 million
AV-8B	$23.6 million

Obviously, production rate and total quantity have a major influence on cost. The above costs are based on projected production rates, i.e., 84 F-18s and 18 AV-8Bs in Fiscal Year 1983. It is interesting to note that if AV-8B were procured at the rate and quantity as F/A-18, the unit cost for AV-8B would be approximately $14.0 million.

QUESTION: General White, the requested procurement quantity of 18 aircraft for Fiscal Year 1983 is a reduction of 6 aircraft from the 24 forecasted for procurement for Fiscal Year 1983 last year. What effect will this have on unit cost of the AV-8B? In this regard, is there a difference due to the production learning curve of AV-8B costs compared to F-18 costs?

ANSWER: According to USMC analysis, the cost penalty of reducing the Fiscal Year 1983 AV-8B request by six aircraft (24 to 18) increases the unit cost by $1,600,000.

By the same token, for example, if the F-18 procurement were to be reduced by six aircraft in Fiscal Year 1983, the unit cost would increase by only $220,000.

Both of these figures are at the fly-away unit cost levels.

The F/A-18 is further down its learning curve and, therefore, the unit cost is less sensitive to procurement numbers in a given year. One hundred sixty nine F-18s have been ordered vs 12 AV-8B.

The AV-8B is just getting started down the curve and the unit cost is extremely sensitive to procurement quantities.

Our stand-up of the AV-8B program in a timely and efficient manner is extremely important to the Marine Corps, a goal which is out of reach at the present production rate.

QUESTION: General White, are you satisfied that the cost of the AV-8B is under control?

ANSWER: Flight development program for YAV-8B prototype was completed within 3% of predicted costs.

The full scale development contract cost performance report, with 75% of scheduled work completed, is showing "on cost" after 3 years of development.

The 1982 pilot production airframe contract cost target has been negotiated and agreed by both McDonnell Aircraft Company and Naval Air Systems Command.

In summary, there is no reason to believe that cost problems will be encountered within the AV-8B program. Future cost growth, if any, would be associated with reduced procurement rates, or inflation over and above DOD guidelines.

AV-8B SORTIE RATES AND ORDNANCE LOADS

QUESTION: General White, how would daily sortie rates of the AV-8B compare with those of other aircraft such as the F-18?

ANSWER: The daily sortie rates, in a typical combat scenario, for AV-8B and F/A-18 are as follows:

	FIRST HALF OF SCENARIO	SECOND HALF OF SCENARIO
AV-8B	4.5 sorties/day	3.6 sorties/day
F/A-18	2.5 sorties/day	2.0 sorties/day

It should be remembered that the AV-8B fuel burned is only 60% of that of the F-18.

QUESTION: General White, how would the AV-8B compare with other attack aircraft in terms of ordnance loads that could be carried on each sortie?

ANSWER: The following average operational ordnance load/sortie can be delivered by the aircraft indicated:

	AV-8B	F/A-18	AV-8C	A-4M	F-4S	A-6E
MK-82 LD/HD	(D)	(D)	(D)	(D)	(D)	(D)
MK-83	(D)	(D)	(D)	(D)	(D)	(D)
MK-84	(D)	(D)	(D)	(D)	(D)	(D)
MK-20	(D)	(D)	(D)	(D)	(D)	(D)
CBU-72	(D)	(D)	(D)	(D)	(D)	(D)
ZUNI Pods	(D)	(D)	(D)	(D)	(D)	(D)
MK-77	(D)	(D)	(D)	(D)	(D)	(D)
Laser Maverick	(D)	(D)	(D)	(D)	(D)	(D)
IIR Maverick	(D)	(D)	(D)	(D)	(D)	(D)
LGB-82	(D)	(D)	(D)	(D)	(D)	(D)
LLLGB-82	(D)	(D)	(D)	(D)	(D)	(D)
LGB-83	(D)	(D)	(D)	(D)	(D)	(D)
LLLGB-83	(D)	(D)	(D)	(D)	(D)	(D)
LGB-84	(D)	(D)	(D)	(D)	(D)	(D)
Gator	(D)	(D)	(D)	(D)	(D)	(D)

QUESTION: Does this mean the AV-8B can put more ordnance per day on target?

ANSWER: By virtue of its capability to be based at unprepared sites and in close proximity to the ground forces being supported; and due to its weapons load that equals or exceeds most modern light attack aircraft; and due to its high reliability and maintainability (allowing rapid turn around between sorties) the AV-8B can put more ordnance on a particular target within a given time or can attack more targets than any other light attack aircraft.

AV-8B FALKLAND ISLANDS

QUESTION: General White, we have seen various media reports of the UK Harrier successes in the Falkland Island conflict. How does the Marine Corps assess this and/or other information you might have along these lines?

ANSWER: Senator, the Marine Corps has a particular interest in the Harrier successes in the Falkland conflict. Although the extent of our information is limited to that of public domain, i.e., the media coverage, we have compiled some very interesting data.

It is our impression that the Royal Navy has operated the Harrier superbly under conditions of extremely bad weather, high winds, and high sea states.

In addition to the Harrier's brilliant air-to-air victories, Harrier attacks on ground targets, including the runways at Stanley and Goose Green, using 1000 lb bombs, have denied use of these facilities. Ships, helicopters and aircraft have also been destroyed.

Survivability of the Harrier has been remarkable. The aircraft has sustained missile and AAA fire and has been able to return to base. However, reports indicate that there have been 3 shot down by ground fire (missiles and AAA) and there have been 3 operational losses due to weather.

The basing flexibility of the Harrier has once again been confirmed. The British have based this aircraft on the Atlantic Conveyor - a container ship converted to accommodate flight operations in a matter of days. She carried 20 aircraft, none of which were lost in her sinking. Other, smaller, helicopter decks have been used, by RAF pilots, having no carrier workup, with total success. Harrier operations have been on a sustained 24 hour basis, both from carriers and ashore from austere, unprepared sites.

The lessons learned by this amphibious operation will be of special value to the Navy and Marine Corps - even more so than the 1973 Arab/Israeli War.

QUESTION: General White, I understand that the AV-8 Sea Harrier has had a favorable exchange rate in air-to-air combat in the Falklands conflict. What can you tell us about this?

ANSWER: As of the hearing date, there were air-to-air engagements on a grand scale between UK Harriers and Argentine Mirage, Canberras, Sky Hawks and various helicopters. The box score favored the Harriers by 20-0. There have been no Harrier losses in air-to-air combat. The Harrier's primary weapon used has been the AIM-9 Sidewinder.

The Harriers have a distinct advantage provided by on-board radar, the ship radar, and by the Harriers vectored thrust-turning capability.

Since the hearing date, we have gained additional information that credits the Sea Harrier with approximately 30 air-to-air kills still with no Harrier losses. In one particular engagement two Harriers engaged three Mirages (supersonic capability) and destroyed all three.

This unparalleled performance fully substantiates this unique aircraft's combat capability.

AV-8B SAFETY OF FLIGHT

QUESTION: General White, I understand that design changes incorporated in the AV-8B will reduce pilot workload and improve flight characteristics making the aircraft safer. Do test flights verify this?

ANSWER: The AV-8B has been designed to be more stable about all three axes than the AV-8A. In addition, it has more control power about all axes during powered lift (V/STOL) flight. The high workload regime has been dramatically reduced, since the wing is actually flying at about 40 knots as opposed to 90-120 knots in the AV-8A. During AV-8B flight tests, workload - as measured in terms of frequency and magnitude of control inputs - has been quantitatively shown to be 65% lower in the AV-8B than in the AV-8A during the same V/STOL evolution.

The unanimous thread found in the test pilot post flight debriefs concerning the AV-8B is that the aircraft workload in the V/STOL regime is much less than the AV-8A. Qualitative pilot opinion reveals an estimated 60 to 80% workload reduction. Increased aircraft responsiveness and available performance found in the AV-8B during V/STOL flight should assist pilots in avoiding extremis flight environments. Typical comments:

"Great flying airplane."

"Excellent visibility."

"The AV-8B is a tremendous step forward as a place to work."

"Transition characteristics to and from hover are considered excellent."

"Landing and takeoff qualities are excellent, workload is about 1/5 of AV-8A."

SUBCOMMITTEE RECESS

The subcommittee will stand in recess until Wednesday, June 9, at 8 a.m., when we will receive testimony from outside witnesses.

Admiral **McDonald**. Thank you very much, Mr. Chairman.

[Whereupon at 12:05 p.m., Thursday, May 27, the subcommittee was recessed to reconvene at 8 a.m., Wednesday, June 9, 1982.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

WEDNESDAY, JUNE 9, 1982

U.S. Senate,
Subcommittee of the Committee on Appropriations,
Washington, D.C.

The subcommittee met at 8:15 a.m., in room 1114, Everett McKinley Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Garn, and Rudman.

NONDEPARTMENTAL WITNESSES

Opening Statement of Senator Garn

Senator **Garn**. The subcommittee will come to order.

I am sure the chairman, Senator Stevens, will be here shortly, but in the interest of the tight schedule we will begin.

The subcommittee will receive testimony today on the fiscal year 1983 defense appropriations bill from witnesses outside the Department of Defense.

On behalf of the subcommittee membership I would like to welcome all of the witnesses this morning. In order to accommodate all of the groups scheduled to testify, we ask that you summarize your statements in 10 minutes or less and we will include your entire written statements in the record.

Our first witness this morning is C. A. "Mack" McKinney, senior vice president of Government affairs, the Non-Commissioned Officers Association of the United States of America.

Mr. McKinney, we are happy to have you with us this morning.

Non-Commissioned Officers Association

STATEMENT OF C. A. "MACK" McKINNEY, SENIOR VICE PRESIDENT, GOVERNMENT AFFAIRS, NON-COMMISSIONED OFFICERS ASSOCIATION OF THE UNITED STATES OF AMERICA

CONSIDERATION OF DEFENSE PRIORITIES

Mr. **McKinney**. Thank you, Mr. Chairman.

I appreciate this opportunity to be here this morning and I would like to summarize my statement as requested and have my prepared statement placed in full in the record.

Recent conversations between my organization and senior military officials have convinced our association that there are some important defense priorities that must be considered by this distinguished panel in Congress.

They are, one, arming and equipping the conventional forces, including the Reserve and Guard and, two, providing continued compensation comparable to the civilian sector and quality of life improvements for U.S. military personnel, particularly those serving in the NCO and petty officer and midlevel commissioned officer grades and, of course, keeping faith with the men and women of the U.S. Armed Forces once a commitment has been made to them.

We realize, Mr. Chairman, that these are very difficult times. However, with its membership of more than 250,000 NCO's and petty officers, of which 83 percent are active duty military personnel, the association has a pulse on what the service members are thinking.

It was this organization, NCOA, that some 6 to 7 years ago forecast to Congress the immediate past exodus of NCO's and petty officers long before the military services brought the issue to the attention of this committee and the Committees on Armed Services.

Again, we are here today, sir, to recommend to Congress that it not place a cap on or freeze or defer increases in military pay, retired pay, and the quality of life improvements promised earlier by this administration.

Equally important to the military service is for Congress to adequately arm and equip the Nation's soldiers, sailors, marines, airmen, and coastguardsmen.

Each of these are addressed in the association's prepared statement.

COMPENSATION AND BENEFITS

However, please permit me to say a few words on the issue of compensation and benefits. The Congressional Budget Office has reported that a cap on military pay will not affect recruiting. Now my Association agrees to this, but it takes exception to the CBO's statement that the cap will have only a minor effect on retention. We ask, on retention, of whom are we talking about, first- and second-term reenlistees, or are we talking about experienced third- and fourth-term reenlistees? I submit that CBO as well as other governmental agencies and officials who claim we have such great retention rates are not speaking of the latter group.

The last exodus that we had in the NCO and petty officer grades drained more than 100,000 experienced, qualified, and skilled NCO's and petty officers from the military service. Replacements for them cannot be made overnight in spite of accelerated promotions to fill their ranks. The General Accounting Office has brought this issue to light in its reports on Army basic training and skilled qualifications tests. Problems exist in these areas as well as others because of the shortage of experienced NCO instructors.

Of course, comparable compensation and improvements in quality of life programs are not the only concern of NCO's and petty officers. They want to have the weapons and equipment necessary to train their subordinates and available in the event of mobilization. NCO's and petty officers are pledged to take care of the troops. If they do not have the resources to do so their time of course is nonproductive.

All they ask is a fair shake from the Government. They have sworn to defend against all enemies whosoever. When they know that Congress is thinking and doing otherwise they will heed the advice of former President Carter's Executive Director for the President's Commission on Military Compensation, and that is, vote with their feet.

Mr. Chairman, the Nation's Armed Forces can ill afford to lose more of these experienced NCO's and petty officers as well as midgrade commissioned officers. Therefore, the association urges this distinguished panel and Congress to carefully review the association's prepared statement, heed its warning of probable experienced manpower problems and appropriate adequate funds for the prevention of further deterioration of the Nation's defense posture.

That concludes my summary, Mr. Chairman, and I will be happy to answer any questions that I may.

Senator GARN. Thank you very much, Mr. McKinney. We appreciate your testimony and we will pay close attention to your entire statement.

Mr. McKINNEY. Thank you.

Senator STEVENS. I am sorry to have been late. Thank you very much.

[The prepared statement of Mr. McKinney follows:]

PREPARED STATEMENT OF C. A. (MACK) MCKINNEY

SERGEANT MAJOR USMC RET.
SR. VICE PRESIDENT FOR GOVERNMENT AFFAIRS

NON-COMMISSIONED OFFICERS ASSOCIATION

MR. CHAIRMAN. As a spokesman for the NON COMMISSIONED OFFICERS ASSOCIATION of the USA (NCOA) I extend appreciation for the opportunity to comment today on the legislative proposal before this distinguished panel, the FY 1983 Defense Appropriations Bill.

I am C.A. "Mack" McKinney, a retired Sergeant Major, United States Marine Corps, and the Sr. Vice President for Government Affairs, NCOA.

I represent more than 250,000 noncommissioned and petty officers of the United States Armed Forces. Eighty-three percent are on active duty with the Army, Navy, Marine Corps, Air Force and Coast Guard. The remainder consist of reservists, national guardsmen, retirees and former members of the armed forces.

BUDGET

Recently, the Senate has approved the FY '83 Defense Authorization Bill that calls for a number of cuts in the pay and allowances of military personnel, reductions in O&M funds, and cuts in procurement of weapons and equipment— all vitally important to maintaining the Armed Forces in a high state of readiness. NCOA is opposed to these reductions and addresses each of them in the following text.

PAY AND ALLOWANCES

Some time ago, and for a period of four-to-five years thereafter, NCOA warned this distinguished panel as well as its counterpart in the House, and both the Senate and House Armed Services Committees, that the United States was facing major losses of qualified and experienced Noncommissioned and Petty Officers of the Armed Forces. It urged Congress to act expediently to deter the anticipated exodus. Regretably, Congress reacted too late and by 1980 the military services were alarmingly short of career enlisted personnel who recruited, trained and led the bulk of military manpower— those in pay grades E-1 thru E-5.

It was only upon the public announcements of the current Chief of Naval operations and Army Chief of Staff, that their services were suffering serious manpower readiness deficiencies, that Congress concerned itself with the situation. The increases in pay and allowances that Congress provided in late 1980 and again in 1981, stopped the flow of experienced manpower— but it was too late.

Today, the Association finds a false euphoria among many governmental officials relative to the current military manpower picture. Recruiting is excellent and retention is running at a better-than-expected rate. However, it will be some years before the Armed Forces are able to overcome their shortages of skilled and experienced NCOs and Petty Officers. The Army and the Navy, particularly, are short tens of thousands of these middle-grade and senior enlisted personnel. Although, their ranks may be filled through accelerated promotions, the ability, skills and experience is not there, and only time— if we have it— will heal the wound that now exists.

This distinguished panel has heard from many senior Defense and military officials who boast that everything appears to be working well. In a sense this is true, but only if Congress continues to improve the quality-of-life for the men and women who volunteer to serve in the Nation's military services. If these servicemembers, particularly NCOs and Petty Officers, find that Congress will cut back in FY 1983 on improvements and equipment, which appears to be the case, and the civilian economy takes a turn for the better, they will begin another exodus that could be more damaging than the last one.

The Association will not belabour the fact that there is a broad difference between the men and women who served 10, 20, or 30 years ago and those serving today. However, we can recognize the fact that the American way-of-life has accustomed our citizens, particularly the young, to expect more and better means of livelihood. The current crop of servicemembers now live and socialize with their civilian brothers and sisters. They do not complain of the "X" factor of military life that separates them from the civilian sector, but they do insist on having a nearly-comparable quality-of-life for themselves and their families which is available to the civilian community.

You will find to your liking a new countenance in the armed forces. The average junior servicemember of three years ago has been replaced by one who is more competent, dedicated, proud and who possesses a higher-level of educational attainment prior to enlistment in the military service. Recruitment and retention of this type of servicemember is reducing the attrition rate and stabilizing the forces to a point where assession and training costs will be significantly curtailed in the coming years.

There is a new hope out there among servicemembers. It is essential that Congress continue the momentum of 1980 and 1981 or else the Nation shall find itself unable to meet the military manpower challenges of tomorrow.

RECRUITING

With the high accession rates now enjoyed by the military services, Congress is prone to curtail appropriations for the recruiting services. In late 1982, if we are to believe the Administration's forecast, the economy will have an up-swing from its current recession.

When this occurs, and NCOA derives its knowledge from experience, more and more young men and women will choose not to enlist in the armed forces, regardless of the pay, bonuses and allowances offered by the military services. Then too, there will be fewer and fewer young people in the job market that are available for recruiters to contact and, possibly, enlist in the armed forces.

NCOA believes it is not only a necessity for Congress to fully fund the recruiting and advertising requests of the military services, but to take a hard look at the sacrifices many of their recruiters must make to successfully fulfill recruiting missions.

There are tens of thousands of military personnel assigned to recruiting and independent-type duties who are far removed from military installations. Although they are in receipt of extra-allowances, the payments are not equal to the losses suffered by not having access to military medical care, commissaries, exchanges, and morale, welfare and recreational (MWR) facilities.

For too long Congress has ignored these people offering only bits here and there to improve their way of life. It should be recognized that these servicemembers experience greater challenges; financially, physically and mentally; than those who serve on most military installations.

One important point that needs to be brought to the attention of this distinguished panel is dependents of military personnel on independent duty, with no availability to military installations. They should have 100 percent coverage under CHAMPUS. It is only fair and reasonable that Congress provides them this badly needed financial assistance.

OTHER O&M ACTIVITIES

There is talk of reducing other O&M functions that maintain the quality-of-life programs for servicemembers. NCOA is in hope that it is nothing more than conjecture and Congress does not take such proposals under serious consideration. Any reductions in commissary funds, medical benefits, travel and transportation or other subsidies will not be lightly taken by the men and women in uniform.

Frankly, the perception that Congress, again, is using military personnel programs to reduce expenditures is having a serious affect on morale. This factor is addressed later in discussing the next subject matter; however, it is important that Congress pay particular attention to the ailment. If festered by actual cuts across-the-board without consideration of the ramifications involved, servicemembers are going to "vote with their feet." NCOA states unequivocally that the Nation can ill afford further losses of qualified and experienced military personnel.

Many governmental officials, including members of the Senate and House, are suggesting that if the Administration or Congress explains the current federal financial situation to servicemembers, the latter group will be willing to sacrifice. NCOA submits that such may be true of newer servicemembers, but it may not have too much credibility with those who have more than four years of service. Career personnel (those with four or more years of service) know they were the "sacrificial lamb" back in the 1970s when the economy was doing well. During that decade, servicemembers felt the stings of one curtailment after another. Benefit after benefit lost out to budget cutters. Then, if not enough, two former Presidents imposed caps on military pay because they claimed that such action would set an example to the civilian sector— the group that was enjoying higher and higher salaries as each year progressed to the other.

Of course, all of us are acutely aware that the Presidential caps did nothing to restrain the wages in the civilian community. And all of us are aware that the 1980 and 1981 increases in pay and allowance brought military compensation to a "comparable" level with civilian salaries, but they did nothing to make-up for the lean years that went before.

To ask military personnel to "bite the bullet" because the civilian sector must now do so, is like asking a half-naked person to give up his or her pants simply because others are now being asked to suffer the loss of only their shirts.

EQUIPMENT AND WEAPONS

For reasons that may be obscure to the Association's officials and membership, the FY 1983 defense budget requests billions of dollars for the procurement of strategic weapons. The United States should possess sufficient nuclear systems that are adequate to deter the Soviet Union from using like weapons as a threat against the United States.

The need, as explained to NCOA representatives by high-ranking military officials and its own membership of active, reserve and guard NCOs and Petty Officers, is in the conventional forces. Our armed services personnel are not armed with the weaponry and equipment that is required to stop an aggressive conventional attack on the U.S. and/or NATO by superior Soviet forces.

The Association has not inserted herein a chart depicting the relative number of U.S./NATO weapons v. those of the U.S.S.R./ Warsaw Pact. It believes the Subcommittee is quite familiar with the comparative figures and need not be reminded of the disparity involved. The numbers speak for themselves and NCOA believes it must be a congressional priority to mandate the expedient arming of U.S. forces with modern, technologically-superior weapons, both offensive and defensive, as well as providing the necessary logistical support to sustain our servicemembers over a lengthy period of warfare.

Our servicemembers may be superior to those of the Soviet armed forces, but can we, in good conscience, place our well-trained personnel— armed with only a bayonet— up against a weaker foe carrying an automatic rifle. That, in perspective, is exactly what we're doing today with the all-volunteer force.

The Association, earlier in this statement, referenced the morale factor. It is extremely important in dealing with people, in particular, military personnel. Adequate compensation and quality-of-life improvements are required, but it is also necessary that the services provide the proper equipment and weapons for their troops to have for training and immediate availability in the event of emergency mobilization. If not, the servicemembers lose their sense of direction, become insensitive to the mission they know cannot succeed, and convinced that their time in training is wasted on promises that never materialize.

When morale sags, so does performance. Napolean once observed that an army's effectiveness depends on its size, training, experience and morale— and morale is worth more than all the other factors combined.

RETIRED PAY

The Association has attached to this statement a letter expressing the views of 14 private military organizations, including NCOA, on the proposal to reduce the annual adjustments to military retired pay. The group, known as the Council of Military Organizations (COMO), represents more than one and a half million active, retired, reserve and guard members of the U.S. armed forces and their families. Your attention is invited to the contents of the letter.

Additionally, NCOA offers this thought for your appreciation. The vast majority of military retirees were not recipients of the higher rates of pay provided in today's all volunteer force. Many, about two-thirds of the retired compenent, were enlisted. Their pay while on active duty for 20, 30, or more years was always at or near the poverty level. They made great financial sacrifices in the service of their country while many of their fellow citizens reaped higher salaries in the civilian job market. However great their sacrifices, they were always promised an adequate compensatory reward in retirement.

Many of them participated in combat in one, two or three wars. They served so that this Nation would remain a democracy in which everyone had the opportunity to improve themselves. They served while others sought greater rewards in the civilian sector.

In it inconceivable that anyone would attempt to place these dedicated men and women in an all-encompassing-group of federally sponsored retirees, then call upon them again to make more sacrifices for their country. The Association submits that military retirees have already done their part. They have contributed more than their share. Let's not ask them to do more until all others have shouldered their part of the Nation's burden.

CONCLUSION

These are hard times. There are demands to balance the budget or reduce projected deficits in the proposed FY '83 budget. However, the Nation must not permit the defense posture of its armed forces to lag further behind that of the Soviets'. Experienced manpower and well-equipped forces with weapons that are superior to those of the Soviet Union is the only way the United States can meet its defense commitments and be prepared to protect its world-wide interests.

The Nation has demanded an all-volunteer force rather than have its youth subjected to universal military service. So be it, but the Nation's tax payers must be prepared to pay the high costs involved. The AVF cannot continue to be a success without the firm commitment of our citizens and this Congress. And, both must be willing to provide the military with adequate equipment and weapons to arm the AVF for any mission that is required under any and all circumstances. To do otherwise is not only breaking faith with those who serve in our armed forces, but placing our Nation under greater threat from world-wide Soviet intervention or aggression.

Consequently, the Association petitions this Subcommittee and Congress to appropriate the necessary funds to:

1. provide an 8 percent "targeted" pay increase on Oct. 1, 1982, for the active, reserve, and guard components of the U.S. armed forces;

2. implement the programs authorized by law that were not funded or fully funded for FY 1982 (i.e.- equitable per diem payments to enlisted personnel;

3. continue improving the quality-of-life programs for the active and reserve forces that were originally requested for O&M in the President's FY 1983 budget;

4. adequately equip and arm the conventional forces to meet their commitments as established in law and policy; and

5. retain the current system in law that annually readjusts military retired pay.

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The Council of Military Organizations (COMO), consisting of fifteen military oriented organizations representing over one and a half million active and retired members of the uniformed services and their families, is deeply concerned about the Administration's proposed reductions in the military compensation system. In effect, these proposals will place an inordinate share of the economic recovery program on the shoulders of people who have given dedicated service to their country. Furthermore, this will be perceived as a blatant breach of trust in which the government, after accepting service, elects to change the terms of that service.

The military retired pay system is the single most significant factor that causes a member to select a military career. Reducing the value of the retirement system will most certainly lessen the services' ability to retain a career oriented professional force. The current success in the recruitment area can be attributed to two primary factors: 1) the recent increases in pay and allowances, and 2) the high unemployment rate that exists in the civilian sector. This success will show dividends only if these newly acquired members are encouraged to reenlist and extend beyond their current commitments. To limit the inducements to reenlist now by drastically diminishing the value of the retirement system would be most foolhardy and ill advised. By enacting the proposed legislation, the national security of our nation could be placed in serious jeopardy through the failure to retain a career force with the ability to maintain and use the technically complicated weapons of modern warfare, and to train others in their use.

Since 1972, basic pay has been subjected to frequent pay caps and reallocations of annual pay adjustments resulting in a depressed initial retired pay. Retirees have been victimized by repeated reductions in the value of their retirement compensation since 1958; the most recent the annualizing of the cost of living adjustment last year. All active duty and retired members will view these current proposals as a breach-of-faith by their government in changing the compensation they expected to receive for the military service they have performed.

Many dependents receiving benefits from the military survivors benefit plans (RSFPP/SBP) will also be adversely affected by these proposals. Retirees who elected to contribute a share of their retirement income for coverage under these programs expected their survivors to receive a level of benefits which were inflation protected. Enactment of the proposed legislation would cause a constant erosion in the standard of living of these beneficiaries. In fact, some of the savings contemplated in this legislation may not be realized since the reduction in SBP benefits, in certain instances, would be replaced by increased Social Security benefits.

Before any action is taken on these proposals it is strongly recommended by the Council of Military Organizations that a thorough detailed analysis be made to insure that the best interests of our nation are served. To approve these proposals arbitrarily in order to achieve short term savings would indeed be a disservice to the men and women who dedicated the best years of their lives to the defense of this nation.

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NATIONAL DEMOCRATIC POLICY COMMITTEE

STATEMENT OF SUSAN KOKINDA, WASHINGTON REPRESENTATIVE, NATIONAL DEMOCRATIC POLICY COMMITTEE

COMMITTEE ACTIVITIES

Senator GARN. Susan Kokinda.

Ms. KOKINDA. Thank you, Mr. Chairman and Senator Garn.

The National Democratic Policy Committee is at this point composed of 600 chapters around the country and 16,000 members.

One of the activities that our chapters have engaged in over the course of the past spring is an intervention into the peace and nuclear freeze movement to the end of punching some holes in their sails from the following standpoint.

Our members have challenged that movement, with the contention that if they are truly interested in ending the reign of thermonuclear terror that the most efficient, the most effective, and the only sane way to do that is the rapid deployment and development of space-based particle-beam antiballistic missile capabilities. Surprisingly, perhaps, given the media buildup and play around the nuclear freeze and peace movement, most people who have actually heard this proposal have recognized that it indeed is a serious approach to actual strategic stability in the world.

Another point that we have made, however, in these interventions is that the peace movement by and large, with the exception of many well-meaning people who clearly are afraid of nuclear holocaust, has actually been a cover for a substantial redirection of NATO forces toward conventional population war deployments below the Tropic of Cancer, and that is a point which I will elaborate on in a few moments.

The proposal that our chairman, Mr. LaRouche, has made has been echoed by others. John Rhodes in a recent very profound floor statement in the House of Representatives as well laid out the need for that kind of Manhattan project or Apollo-style commitment to that kind of capability.

Let me stress two points.

SPACE-BASED PARTICLE-BEAM ABM CAPABILITIES

First of all, we are talking about the development and deployment of space-based particle-beam ABM capabilities. We are not talking about using the development of that capability simply as a bargaining chip.

Second, we are not talking about the Heritage Foundation high-frontier approach which has taken Gen. Daniel Graham's very admirable efforts in this field and pushed them off into the somewhat distant future under the guise of a near-term deployment of conventional space-based weapons.

We are talking about the very rapid deployment immediately of particle-beam high-technology space-based capabilities. This of course would mean the rejection of the Kissingerian mutually assured destruction doctrine which has dominated our military strategic policy for nearly three decades. But there is a more important point in this, and I think Congressman Rhodes strikes a very important chord when he locates this type of defense policy in the context of a full-press effort to actually bring the benefits of high technology to the rest of the world.

I have a quote from Representative Rhodes in my testimony which I will summarize. He states at one point that energy plus technology, plus a good labor supply, plus good management can make an industrial nation out of an underdeveloped one in just a few years, and he locates this in the context of full development of fusion energy capabilities in the most advanced frontiers of technology.

Now I would suggest that that is the most fundamental point that we should be looking at in our military strategic doctrine. If we want to talk about force projection, let's talk about force projection of American economic might to the end of actually stabilizing the hot spots in the world.

This is a very important point because the countervailing strategic policy, which the United States is slipping more and more into at this point, is based on precisely the opposite contention. It is based on a Malthusian contention that the wars of the 1980's will be resources wars and population wars born of the crisis confronting us. This is quite explicit in the policy proposals of people like Maxwell Taylor, the Harriman wing of the Democratic Party, Henry Kissinger, and others.

I would suggest that they are setting up a self-fulfilling prophesy and I would suggest that the current emphasis in NATO and Anglo-American policy discussions on the inadequacy of NATO's conventional capabilities and the need to project NATO into out-of-area deployments is precisely the implementation of this policy.

The June 4 NATO Foreign Ministers comminique stated for the first time that NATO is preparing to look at the question of out-of-area deployments. And as Secretary Weinberger confirmed in a June 4 interview in the West German daily Die Welt, the Falkland Islands crisis is precisely proving to him and to the rest of NATO the need for that kind of out-of-area deployment below the Tropic of Cancer.

I think if you look very carefully at the writings of the leaders of the peace movement, such eminently peaceful people as Robert McNamara and McGeorge Bundy, if you look at the Foreign Affairs article authored by McGeorge Bundy and others this spring, you will see that this is really what they are talking about in their discussions of nuclear freeze or peace or whatever the case may be: The development of NATO to fight population wars below the Tropic of Cancer.

I suggest that if we follow that policy we are going to see a diminution of American policy, as we have already started to see it in Latin America and as I believe we are seeing it in the Mideast at this point. This is not what America's historic role has been. This is going to put the world in a situation where we have one superpower acting in a strategic vacuum where the other superpower is tailing behind policies which are inimical to its interests.

CONVENTIONAL POPULATION WARS DOCTRINE

In conclusion, I would just like to make one very fundamental point in terms of this. This doctrine of conventional population wars is not an American doctrine. It is a British doctrine.

I would like to point out a speech which the media in the United States saw fit to ignore, a May 10 speech by Henry Kissinger in London at the Royal Institute of International Affairs where, among other things, he states that during his tenure at the White House he kept the British Foreign Office better informed and more closely engaged than he did the American State Department. And he decries the fact that American postwar policy has not followed the dictates of British foreign policy, British neocolonial policy as much as it should have. I think Henry Kissinger is probably quite pleased right now with the direction of U.S. foreign policy.

I think the necessary first step to restoring America to its rightful role as a superpower is a full-scale national effort to end the reign of thermonuclear terror with the deployment of space-based, high-energy, antiballistic-missile capability and the restructuring of our military doctrine around that capability and around the commitment that that carries with it for the full-fledged economic development and the stabilization of the world.

I think any other discussion of defense policy at this point is diversionary at best or directly contrary to U.S. national security interests.

Thank you.

Senator **STEVENS**. Thank you very much. I had never heard of that speech of Kissinger's.

Ms. **KOKINDA**. I would suggest people study it very carefully. It is a 26-page document which lays out the postwar history of secret agreements between the United States and Britain and Kissinger's role as essentially a flunky of the British Foreign Office.

Senator **STEVENS**. Senator Garn?

Senator **GARN**. No questions.

[The prepared statement of Ms. Kokinda follows:]

PREPARED STATEMENT OF SUSAN KOKINDA
WASHINGTON REPRESENTATIVE
NATIONAL DEMOCRATIC POLICY COMMITTEE

Two opposing strategic doctrines confront the United States, and current defense policy debates are being conducted within the universe of one or the other (whether various "debatees" are aware of the underlying policy considerations or not.) Our purpose in this testimony is to identify those doctrines for this subcommittee. The NDPC proposes that our military-strategic policy be based on the premise that capital-intensive economic growth, both here and abroad, is the only true basis for war avoidance. Within that historically "American" approach to military science, a sane military-strategic doctrine is built around the frontier areas of research and development. The opposing policy, which is the predominant view of Anglo-American policy makers, is fundamentally neo-malthusian. It asserts that the military threats of the 1980's arise from population and resource pressures below the Tropic of Cancer, and that Western military capabilities must be geared toward conventional, "population" wars.

NDPC Advisory Council Chairman, Lyndon H. LaRouche, Jr., in one instance, and Representative John Rhodes, in another, recently issued extensive statements urging the development and deployment of space-based laser or particle-beam anti-ballistic missile systems. As has been pointed out on the floor of the Senate during the FY83 DoD Authorization debate, the deployment of such capabilities, of course, means a rejection of the Kissingerian "mutually assured destruction" doctrine which has dominated U.S. policy making for nearly three decades. But that point is subsumed by a larger principle, elaborated both by Rhodes and LaRouche. A "Manhattan Project" or Apollo-style U.S. commitment to space-based high energy systems would function as a "science-driver" to the rest of the U.S. economy. In conjunction with other investments in advanced technologies such as fusion, such an approach would carry with it the potential for real productivity increase and tangible economic growth in the U.S. economy, and for the rest of the world. Representative Rhodes envisions the following,

"...we should have the most sophisticated defensive systems in the world in Earth orbit, and we should by then have been able to recruit most of the world in a mutual undertaking to provide cheap energy so that all the peoples of the globe can share in its wealth and influence...I would proceed to build a consortium of interested nations to construct satellites in space to produce cheap electric energy for all, and proceed full speed to develop electric energy from fusion of the hydrogen atom...Energy plus technology plus a good labor supply plus good management can make an industrialized nation out of an underdeveloped one in just a few years...."

While LaRouche stresses that the only sane military policy is one centered around a commitment to a crash program to deploy particle-beam space-based systems, he, too, locates that policy in a larger context of "very specific formulations concerning the economic and political order of world affairs. I propose to resume a direction which Franklin Roosevelt threatened to set in place during the course of World War II." LaRouche is referring to Roosevelt's warning to Winston Churchill that the U.S. would not fight a world war a second time to save the British Empire and that in the post-war world, the U.S. would no longer tolerate British colonial methods. Roosevelt illustrated American methods to Churchill and Mountbatten by producing a map of the African Sahel and outlining a high-technology approach of engineering projects to transform the Sahel into the breadbasket of Africa.

The significance of locating U.S. strategic and foreign policy within the context of capital-intensive development for the Third World must not be overlooked. It is significant for the simple reason that the countervailing strategic doctrine, as elaborated by Maxwell Taylor, Henry Kissinger, the Harriman wing of the Democratic Party and substantial elements of this Administration is one of preparing the United States and NATO to fight conventional, "population" wars in the Third World as the malthusian crisis overtakes those sectors of the globe. Mr. LaRouche, in a May 16 policy paper, summarizes it as follows:

"Global 2000, Global Futures and General Maxwell Taylor define the principal threat of the 1980s to be not the Soviet military forces, but the size of population of Latin America, Africa and Asia. They assert that the excessive numbers of black, brown and yellow-hued peoples are consuming altogether too much of the natural resources of the territories they inhabit, natural resources which the anglo-saxon race must conserve for its own future needs. This, very briefly of course, is what Maxwell Taylor and his co-thinkers mean by asserting that 'raw materials and population' are the fundamental strategic issues of the 1980s. As

Taylor and others emphasize, the excessive population' of Latin America, Africa and Asia is for them the fundamental military-strategic issue of this decade and beyond."

The current emphasis of NATO and related Anglo-American policy discussions of the indequacy of NATO's conventional capabilities and the need to project NATO into "out-of-area deployments" (as discussed in the recent NATO Foreign Ministers communique) is the practical fulfillment of this policy. As the NDPC has consistently warned, the crisis in the South Atlantic has had nothing to do with the non-existant rights of some sheep farmers, but has instead been the platform by which the British have brought the U.S. fully into line behind this kind of neo-colonial, out-of-area NATO deployment. In a June 4 interview in the West German daily, Die Welt, Defense Secretary Weinberger confirmed this to be the case, "For the past year I have been urging that more attention be paid to southwest Asia, the Gulf Region. The Falklands situation is just such an occurrence outside NATO's area, thousands of miles away, which concerns NATO and should therefore belong to NATO advance planning....Many NATO countries would rather not think about what goes on outside the NATO area. Great Britain is an exception."

The deployment of the "peace movement" (led by such eminently 'peaceful' characters as Robert "Body Count" McNamara, Maxwell Taylor and McGeorge Bundy) is an important part of this redirection of NATO. As the sundry writings and statements of this group make clear their anti-nuclear weapons stance is complemented by their universal support for conventional NATO buildup aimed at Third World hotspots. (A point of difference does exist between the Harrimanite peace movement and the Kissinger grouping. The Harrimanites argue that NATO must back off from those inds of 'forward nuclear defense' and 'first-use' which tend to bring the NATO-Soviet conflict and tension so close to the Soviet threshhold of war-fighting disposition that local wars in the Third World might actually trigger thermonuclear conflict. By lowering the level of forward nuclear posture in the central European 'fire-break region' they propose to create a condition in which Moscow will not risk interfering in the genocide of populations of developing nations.)

The fundamental bias of the peace movement, which is a profound hatred of technological progress as expressed either in weapons systems or in economic development, extends from Kissinger to the Harrimanites. It is that which defines their perceived need for conventional, population wars and which defines their opposition to the development and deployment of advanced systems such as space-based lasers.

The choices facing this subcommittee and the Congress in 1982 are profound ones. The United States can follow Henry Kissinger's recent advice and subordinate itself even more abjectly to British malthusian doctrines, and eliminate itself as a superpower in the international equation. Kissinger, in a May 10 speech before the Royal Institute of International Affairs said, "Many American leaders condemned Churchill as needlessly obsessed with power politics, too rigidly anti-Soviet, too colonialist in his attitude to what is now called the Third World, and too little interested in building the fundamentally new international order toward which American idealism has always tended...The dispute was resolved according to American preferences--in my view to the detriment of postwar security." (It was in this speech that Kissinger remarked that "I kept the British Foreign Office better informed and more closely engaged than I did the American State Department).

In conclusion, I would say that the dispute, as Kissinger described it, has not been resolved according to American preferences and will not be until this country undertakes a military-strategic and foreign policy consonent with the historic, but waning, American commitment to its role as a superpower for peace. The necessary first step in the military sphere is a full-scale national effort to end the reign of thermonuclear terror with the deployment of a space-based high-energy anti-ballistic missile capability and the restructuring of our military doctrine around such a capability. Any other discussion of defense policy is diversionary, at best, or directly contrary to U.S. national security interests.

NATIONAL GUARD ASSOCIATION OF THE UNITED STATES

STATEMENT OF MAJOR GENERAL FRANCIS S. GREENLIEF (RETIRED), EXECUTIVE VICE PRESIDENT, NATIONAL GUARD ASSOCIATION OF THE UNITED STATES

Senator **STEVENS**. Now we have the National Guard. Major General Greenlief.

General **GREENLIEF**. Good morning, Mr. Chairman and Senator Garn.

I appreciate very much this opportunity to present the views of the National Guard Association of the United States on fiscal year 1983 appropriations for the Army and Air National Guard.

My full statement addresses our views on needed funding in fiscal year 1983 for personnel, equipment, organizational clothing and equipment, and full-time unit support personnel. In addition, I will comment on a very serious problem relating to the status of Army National Guard personnel performing full-time military duty under the Active Guard Reserve, the so-called AGR program.

PERSONNEL

The fiscal year 1982 budget provided funds to permit the Army Guard to obtain an end strength of 398,000. At end April 1982 the personnel strength of the Army Guard was in fact 408,000. Now the Department of the Army has reprogramed $47 million to the Army Guard to permit the Guard to attain a fiscal year 1982 strength of 410,000, but that is the maximum capability of the U.S. Army to transfer funds to the Guard.

Now although the Guard Bureau estimates that the Army Guard could easily attain an end fiscal year 1982 end strength of 417,000, the NGB has had to place ceilings on the States to limit the fiscal year 1982 strength to 410,000.

The fiscal year 1983 NGPA budget estimates supports a beginning strength of 398,000 and an end strength of 417,000. Since the Army Guard beginning strength will be at least 410,000, an additional $14.8 million is needed in fiscal year 1983.

Senator **STEVENS**. How do you get that $14.8 million?

General **GREENLIEF**. I got it, sir, by asking the National Guard Bureau what it would cost to pay the strength onboard.

Senator **STEVENS**. Thank you.

General **GREENLIEF**. In our view it is essential that the Army Guard attain at least the programed fiscal year 1983 end strength because of the continued serious shortage in the IRR and because the Army program calls for the Army Guard to attain an end strength of 465,000 in fiscal year 1988.

Now if the Army Guard opens fiscal year 1983 at 410,000, as we anticipate, and ends fiscal year 1983 at 426,000, as we believe is possible, the total increase needed in NGPA is $31 million with an increase of $4 million in O&M.

Senator **STEVENS**. That is total now. That is not an addition to the $14.8 million.

General **GREENLIEF**. That is total, sir, starting at 410 and ending at 417.

EQUIPMENT

The Senate fiscal year 1983 defense authorization bill includes $550 million specifically earmarked for procurement of equipment for the Guard and Reserve, and the House bill includes $1.2 billion specifically earmarked for the Guard and Reserve.

We urge that your subcommittee recommend appropriation of fund to procure all of the Guard and Reserve equipment which is finally authorized in the conference bill.

OPERATION AND MAINTENANCE

The Senate fiscal year 1983 defense authorization bill adds $20 million for chemical defense equipment, $20 million for cold weather clothing and $3 million for procurement of medical items for the Army Guard and adds $6 million for real property maintenance, $3 million for chemical defense equipment, and $8.2 million for cold-weather clothing for the Air Guard.

Without chemical defense equipment National Guard units could not be effective and could not survive in fact in a chemical warfare environment. Without cold weather clothing National Guard units can fight only in summer or at least in warm weather climes.

We urge that you recommend the full funding of the O&M appropriation add-ons as are recommended in the conference authorization bill.

FULL-TIME UNIT SUPPORT PERSONNEL

There is a proven direct correlation between unit readiness and the number of full-time unit support personnel provided to units, and this correlation is best illustrated by the high level of readiness maintained by the Air National Guard.

The fiscal year 1983 budget provides an increase of 4,800 full-time military personnel offset by a decrease of 1,180 National Guard technicians for a net gain of 3,620 full-time unit support personnel and we are delighted with that gain.

Mr. Chairman and Senator Garn, the National Guard is the strong, well-trained, and well-manned element of the total force, which it is, because of State control in time of peace, not in spite of State control. National Guard leadership, specifically including all of the State adjutants general, has insisted that the National Guard full-time military personnel serve on full-time duty under title 32 and thus under State control, rather than under Federal control as they would be if on active duty in their Reserve of the Army or Reserve of the Air Force status.

The Army has now made a determination that the authority of title 32 permits these full-time military personnel to be ordered to active duty as Reserves of the Army. That determination effectively places these personnel under Federal control, and we view this action as contrary to the intent of the militia clause of the U.S. Constitution and as a Federal takeover in time of peace.

We urge that your subcommittee include in its report language a statement that it is the intent of Congress that members of the National Guard on full-time duty under 32 U.S.C. 502(f) in the AGR program are to be administered in conventional National Guard status by the State adjutants general and not in their Federal status as Reserves of the Army or Reserves of the Air Force.

Senator STEVENS. Unless there is a general mobilization.

General GREENLIEF. Sir, on mobilization, obviously they are under title 10 and they belong to the United States of America. What we are talking about is that the Constitution says that the National Guard in time of peace shall be administered and trained under State control. If these personnel are under title 10, or if, as the Army has concluded, they could be on Federal active duty under title 32, the control has passed to the Federal Government.

We believe the Guard is the component that it is because of State control. When we are mobilized, no question, we are part of the Army and the Air Force and that is what we want to be.

Senator STEVENS. Well, that could be short of wartime.

General GREENLIEF. Sir?

Senator STEVENS. That could be short of wartime.

General GREENLIEF. What we are talking about here are people who are serving in National Guard units day to day. They are performing training supervision, administration and maintenance. They are working for the adjutant general and they are working for the unit commanders, just as do technicians. If they are on active duty, they are then working for the Federal Government and we are very much opposed to that

FORCE REDUCTION RECOMMENDATIONS

Senator STEVENS. There has been some suggestion that there might be force reductions as part of the budget control mechanisms in dealing with the Department of Defense. If there were such reductions, in your opinion, what is the capability of the Army, Air Guard, and the Reserves, to absorb a portion of those people?

General GREENLIEF. A specific example, Mr. Chairman, I noted that in Secretary of Defense Weinberger's so-called hit list to the Senate, his memorandum that said he would accept the cuts in the Senate budget proposal if they were made in certain ways, and he listed the elimination or the inactivation of an active Air Force wing. Mr. Chairman, if that wing is placed in the Air National Guard as opposed to being eliminated, there would be no loss of readiness. We can demonstrate that.

Senator STEVENS. What effect would it be on budget savings?

General GREENLIEF. If you eliminate it and put it in the Air National Guard, then you would not get the complete savings because obviously it would cost money to operate it in the National Guard. About half. If the Secretary of Defense decided to eliminate two wings, put them both in the Air National Guard or perhaps Air National Guard and Air Force Reserve, in my view, there would be no loss of readiness, except for the couple of years it would take to build up. Ultimately there would be no loss in readiness and you would get the same savings as are predicted and proposed in the Senate budget resolution for fiscal year 1983.

On the Army side my memory is that the Secretary of Defense proposed the elimination of four Army battalions. On the Army side we have not yet attained the level of readiness that we have in the Air National Guard, but we have attained a very high level.

Just last year an infantry battalion, a combat battalion from Indiana went on a 3-week annual training period, deployed to Europe as a part of Reforger, fell in on their POMCUS equipment, drew it, did their 3 weeks of duty, turned it in and General Fritzkroesen said they were ready and well-disciplined troops.

So I believe that those four battalions that the Secretary of Defense says he would eliminate from the Army could be organized in the Air National Guard and within a matter of years attain a very acceptable level of readiness and save considerable money.

Senator STEVENS. Thank you.

Senator Garn.

READINESS

Senator GARN. Let me just make a comment on readiness, and I realize my experience is all on the Air National Guard side. During the Vietnam war we were initially puzzled in many of our squadrons, mine included, of why we were not activated. It became readily apparent, rapidly in fact, that they couldn't have gotten many more flying hours out of us on a full-time active duty status than they did on a Reserve status.

Missions at that time, and I admit we were flying prop airplanes and it took about 80 hours to go to Vietnam and back round trip flying, and the number of trips you could get out of an active duty pilot or crews compared to the National Guard or Reserve was so minimally greater, and we were flying almost as many hours per day on a part-time basis.

So a flight officer or pilot would take one of those trips and get 9 days' pay and come home and be off the rest of the month and the active duty pilot got paid for 30 days. So in personnel costs alone getting almost as many flying hours out with 9 or 10 days a month pay rather than 30 days. So the examples, particularly in the Vietnam war, even nonactivated in the amount of flying, I got more flying, General, in the National Guard than I did when I was on active duty by a considerable amount as a part-timer.

General GREENLIEF. Well, Senator Garn, during that period of time I was the Deputy Chief of the National Guard Bureau and I can confirm what you say. The Air National Guard in fact flew 100 missions per month supporting the Vietnam war in our heavy transport units.

Now if they had not done it in that status on a volunteer basis, my view is that there would have had to be a mobilization. My view was there should have been, too, by the way.

Senator GARN. In addition to Vietnam, we were picking up a lot of missions around the world that allowed more active duty aircraft to go to Vietnam as well.

General GREENLIEF. Precisely.

Senator GARN. So it wasn't 100 a month. We were flying missions from South Africa down to Australia, and all of those sorts of missions.

General GREENLIEF. That is absolutely correct. We picked up so many missions worldwide that it permitted the Air Force to divert more of their transport direct to Vietnam.

Senator **Garn**. I would just simply agree with you. It makes a lot more sense to turn some of those units over and cut the costs and still get a good deal of the effectiveness, if not more in some cases, than just elimination.

General **Greenlief**. I would like to make the point, Mr. Chairman and Senator Garn, that I am not declaring war on the Air Force. I am a friend of the Air Force and I support the Air Force. But if the Congress decides or DOD decides that there must be a reduction, then I say that it is time for a Total Force II policy, because we can perform those missions and we can do them at less cost and we can perform and do perform an acceptable level of readiness provided we are equipped.

Mr. Chairman and Senator Garn, in summary, in my statement I said that the National Guard is strong because of State control. It is also true that the National Guard is stronger and readier than it otherwise would be because of the continuing strong support of the U.S. Congress and this subcommittee in particular.

Mr. Chairman and Senator Garn, we pledge to produce the maximum level of combat readiness possible with the resources provided.

I thank you for the opportunity to present our views and I will be pleased to attempt to answer any questions you may have.

Senator **Stevens**. You have already answered them.

Thank you very much. We appreciate it.

General **Greenlief**. Thank you, sir.

[The prepared statement of Major General Greenlief follows:]

NATIONAL GUARD ASSOCIATION OF THE UNITED STATES

PREPARED STATEMENT OF MAJ. GEN. FRANCIS S. GREENLIEF (RET.)

EXECUTIVE VICE PRESIDENT

Mr. Chairman, and members of the subcommittee, I appreciate this opportunity to present the views of the National Guard Association of the United States on FY83 appropriations for the Army and Air National Guard.

As you know, the National Guard is the only component of the Armed Forces which performs a dual role, i.e., Federal and State. On almost any given day of any year, National Guard units, Army and Air, are performing emergency service in some State in the public protection role. This is possible because of the uniqueness of the National Guard as established by the Constituion and many subsequent enactments of the Congress, because of State support (including financial support), and because of the training, equipment, and facilities provided by the Federal government to produce wartime units.

The Army National Guard provides 46 percent of the combat structure of the U.S. Army and a significant portion of the support units of the U.S. Army. The Air National Guard provides 40 to 60 percent of the aircraft of the several Air Force Commands, and 70 percent of the combat communications capability of the Air Force.

The Army and Air National Guard provide such a significant part of Army and Air Force war-fighting capability that those services cannot expect to fight and win unless the National Guard can fight when, where, and as well as the Regulars. Since the National Guard is expected to fight when, where, and as well as the Regulars, we insist that we be manned, trained, equipped and supported as well as the Regulars.

My statement will address our views on needed funding in FY83 for Personnel, Equipment, Organization Clothing and Equipment, and Full-time

Support Personnel. In addition, I will comment on a serious problem relating to the status of Army National Guard personnel performing full-time military duty under the Active Guard and Reserve (AGR) program.

PERSONNEL

All services and all components of the services are doing well in recruiting and retention of military personnel. The Army and Air National Guard have been especially successful. But, because of the tremendous surge in recruiting, the ARNG has a serious financial problem.

The cumulative effect of strong leadership, incentives provided by the Congress, a hard-working effective recruiter force, and a despressed economy, has pushed the ARNG manpower level far above the FY82 budgeted strength. Current strength levels guarantee that the FY83 funded level will be exceeded unless additional funds are provided or the recruiting effort is restrained.

The FY82 budget provided funds to permit the ARNG to attain an end strength of 398,000. At end April 1982, the personnel strength of the ARNG stood at 408,000. The Department of Army has reprogrammed $47 million to the ARNG to permit the ARNG to attain an FY82 end strength of 410,000, but that is the maximum Army capability to transfer funds to the ARNG.

Although the National Guard Bureau (NGB) estimates that the ARNG could easily attain an FY82 end strength of 417,000, the NGB has placed strength ceilings on the States to limit the FY82 end strength to 410,000.

The FY83 National Guard Personnel Army budget estimate supports an ARNG beginning strength of 398,000 and an end strength of 417,000. Since the ARNG beginning strength will be at least 410,000, an additional $14.8 million is needed in FY83.

It is essential that the ARNG attain at least the programmed FY83 end strength because of the continued serious shortage in the IRR, and because the Army program calls for the ARNG to attain an end strength of 465,000 in FY88.

If the Congress adds funds to the NGPA Appropriation, thus permitting the ARNG to continue unrestrained recruiting, the National Guard Bureau estimates that an FY83 end strength of 426,000 can be attained. In our view, this strength growth should be permitted because of the long-range objective of 465,000.

If the ARNG opens FY83 at 410,000, as we anticipate, and ends FY83 at 426,000, as we believe is possible, the total additional increase needed in NGPA is estimated to be $31 million, and an increase of $4 million is needed in the Operations and Maintenance ARNG Appropriation (O&MARNG).

We believe that funding for an FY83 end strength of 426,000 is a most cost effective step toward the long-range goal of 465,000 and urge that you recommend the addition of $31 million to the FY83 NGPA Appropriation, and the addition of $4 million to the FY83 O&MARNG Appropriation.

EQUIPMENT

The Congress has properly concerned itself with the failure of a series of Administrations to budget adequately for so-called readiness items. Generally speaking, a discussion of readiness is taken to mean consideration of those things needed by soldiers and airmen operating their equipment in training or combat. However, when one considers the antiquity of much of the National Guard's equipment and absolute voids of some items of equipment, any discussion of National Guard readiness must address the equipment problem.

With the adoption of the Total Force Policy in FY71, major elements of the active Army and Air Force were inactivated and their roles and missions were passed to the National Guard and Reserves. As stated in Secretary of Defense Laird's Memorandum of August 1970, the purpose of increased reliance on the Guard and Reserves was to reduce defense expenditures, and significant savings were achieved. However, in our view, what has occurred is a classic case of double dipping.

Having reduced defense expenditures by eliminating active duty force structure, a series of Administrations have sought to further decrease defense expenditures by failing to ask the Congress for authority and funds to fully equip Guard and Reserve units to perform the roles and missions assigned them.

The equipment required by a unit is the same whether that unit be an active duty unit or a Guard or Reserve unit. The equipment requirement is generated by the fact that a unit is required by war plans — not by the component which furnishes the unit.

The Senate FY 1983 Defense Authorization Bill includes $550 million specifically earmarked for procurement of equipment for the Guard and Reserves. The House FY 1983 Defense Authorization Bill includes $1.2 billion specifically earmarked for the Guard and Reserves.

We urge that your subcommittee recommend appropriation of funds to procure all of the Guard and Reserve equipment which is finally authorized in the Conference Committee Bill.

OPERATIONS AND MAINTENANCE

The Senate FY 1983 Defense Authorization Bill adds $20 million for Chemical Defense Equipment, $20 million for Cold Weather Clothing and $3 million for procurement of Medical Items for the ARNG, and adds $6 million for Real Property Maintenance, $3 million for Chemical Defense Equipment, and $8.2 million for Cold Weather Clothing for the ANG.

The House Bill adds $30 million for Organizational Clothing and Equipment for all Guard and Reserve forces.

Without Chemical Defense Equipment, National Guard units could not be effective in a chemical warfare environment. Without Cold Weather Clothing, National Guard units can fight only in Summer or in warm climes. We urge that you recommend full funding of O&M appropriation add-ons as are recommended in the Conference Authorization Bill.

FULL-TIME UNIT SUPPORT PERSONNEL

There is a direct correlation between unit readiness and the number of Full-Time Unit Support (FTUS) personnel provided to units. This correlation is best illustrated by the high level of readiness maintained by Air National Guard units.

When National Guard technicians were the sole source of FTUS personnel, the number of FTUS was held far below unit requirements by the legislative ceiling on the number of technicians, by a series of hiring freezes, and by reductions in the total number of Department of Defense civilian personnel. The Appropriation Committees' initiative, which established the Full-Time Military program with National Guard personnel serving on full-time military duty under title 32, USC, has permitted badly-needed growth in the FTUS program.

The FY83 budget provides an increase of 4,800 FTM personnel, offset by a decrease of 1,180 National Guard technicians, for a net gain of 3,620 Full-Time Unit Support personnel.

The National Guard is the strong, well-trained, and well-manned element of the Total Force, which it is, because of State control in time of peace--not in spite of State control.

National Guard leadership, specifically including all of the State Adjutants General, has insisted that the National Guard full-time military personnel serve on full-time duty under title 32, and thus under State control, rather than under Federal Control as they would be if on active duty in their Reserve of the Army or Reserve of the Air Force status. The Army has now made a determination that the authority of title 32 permits these full-time military personnel to be ordered to active duty as Reserves of the Army. That determination effectively places these personnel under Federal control. We view this action as contrary to the intent of the Militia Clause of the U.S. Constitution and as a Federal takeover in time of peace.

We urge that your subcommittee include in its report language a statement that it is the intent of Congress that members of the National Guard on full-time duty under 32 USC 502(f) in the AGR program are to be administered in conventional National Guard status by the State Adjutants General and not in their Federal status as Reserves of the Army or Reserves of the Air Force.

SUMMARY

In my statement, I said that the National Guard is strong because of State control. It is also true that the National Guard is stronger and readier than it otherwise would be because of the continuing strong support of the U.S. Congress and this subcommittee in particular.

Mr. Chairman, we pledge to produce the maximum level of readiness possible with the resources provided.

I thank you for the opportunity to present our views and will be pleased to attempt to answer your questions.

SHIPBUILDERS COUNCIL OF AMERICA

STATEMENT OF STUART S. ADAMSON, VICE PRESIDENT OF THE SHIPBUILDERS COUNCIL OF AMERICA

REPAIR AND OVERHAUL OF SHIPS

Senator STEVENS. The Shipbuilders Council. Steward Adamson.

Mr. ADAMSON. Good morning Mr. Chairman and Senator Garn. I am Stuart S. Adamson, vice president of the Shipbuilders Council of America, a national industry association composed of major shipbuilders, shiprepairers, and ship component manufacturers.

With me today are representatives from the New England Ship Repair Association, the New York/New Jersey Dry Dock Association, and the Western Shipbuilding Association.

Our purpose here today is to support the Department of Defense request for those fiscal year 1983 appropriated funds which will generate activity in our Nation's shipyards, and most particularly that funding associated with the repair and overhaul of ships.

In the interest of time I would submit my statement for the record and just highlight.

The point I would like to make clear this morning, Mr. Chairman, relates to your remarks made earlier last month during testimony on this subject provided by Navy officials. At that time you expressed concern over the impact upon the industrial base that may occur as the result of what you called an overambitious program in terms of both new shipbuilding and catching up on our overhaul and repair of ships.

Let me state, Mr. Chairman, that any doubt about our immediate capability to undertake the planned workload does not match the world as we see it. Under no conceivable circumstances will the planned additions and proposed maintenance of the naval fleet command the full potential of the existing shipbuilding and shiprepairing industrial base.

As you aware, there is considerable time lag between appropriations and the actual start of contracted work. Despite the promises of an expanded Navy shipbuilding program, such work won't appear in our yards in any significant amount for at least 2 or 3 years. In the meantime at least half of our major shipyards that are expected to participate in those programs are simply running out of work.

For the time being our current naval work is falling precipitiously. Employment rolls in this sector since the start of 1979 have been dropping at the rate of some 6,000 workers a year and that decline will not stop until sometime next year.

Our backlog for merchant ship construction is almost nonexistent. It will remain so if present Government inclinations and policy decisions continue to avow the exploitation of commercial ship construction and repair opportunities to foreign shipyards.

It must be understood that our industry needs work now. We need your support to assure the near-term prospects of such programs as the maritime pre-positioning ships, battle ship reactivations, build and charter tankers, and a steady flow of naval ship overhaul work. These programs are necessary for our survival.

So it is that the issue here should not be concern for overtaxing the shipbuilding industrial base in the future. Given today's circumstances, it is difficult for us to even project such a phenomena. Ambitious or not, what the Navy has proposed for new construction and repair will not, in our view, institute full recovery from the spiraling decline that we are now experiencing.

If concern there should be, it must be concern for the absence of measures that must be taken to assure operational and work force stability in U.S. shipyards. We need a volume of work that will insure that this Nation's essential shipbuilding and shiprepairing mobilization base will be maintained. We don't see the current Navy projections alone doing that, but we need as much of that work as we can get.

[The prepared statement of Mr. Adamson follows:]

PREPARED STATEMENT OF STUART S. ADAMSON, VICE PRESIDENT, SHIPBUILDERS COUNCIL OF AMERICA

Mr. Chairman, members of the Subcommittee, I am Stuart S. Adamson, Vice President if the Shipbuilders Council of America, a national industry association composed of major shipbuilders, shiprepairers and ship component manufacturers. With me today are representatives from the New England Ship Repair Yard Association, the New York New Jersey Dry Dock Association, and the Western Shipbuilding Association. Our purpose here is to support the Department of Defense request for the fiscal year 1983 appropriated funds which will generate activity in our nation's shipyards, and most particularly that funding associated with the repair and overhaul of naval ships.

I would like to give particular attention this morning, Mr. Chairman, to your remarks made earlier last month during testimony provided by Navy officials on this subject. At that time you expressed concern over what impact may occur upon the industrial base as a result of what you termed an "overambitious program in terms of both new shipbuilding and catching up on our overhaul and repair backlog."

Let me state, Mr. Chairman, that any doubt about our immediate capability to undertake the plannned work-load does not match the world as we see it. Under no conceivable circumstances will the planned additions and proposed maintenance of the navel fleet command the full potential of the existing shipbuilding and ship repairing industrial base-that includes facilities, support activities and a skilled workforce.

Because of the long lead-time associated with the construction of sophisticated warships, the full impact on shipbuilders of any expanded Navy program is at least three years away. Admittedly, getting from here to there may not be easy without your sympathetic support. At least half of the major U.S. shipyards, with facilities and skills to produce the larger combatant and auxiliary ships projected in the Navy's current five-year plan are now running out ot work. New contracts will come too late to avoid further production and employment disruptions.

In January 1979, only three years ago, we reached a peacetime peak of 75,000 workers engaged in naval ship construction. Over the past five years, annual Administration requests and Congressional appropriations, averaging 16 new ships per year, have not sustained that same level of employment. At the start of this year, employment requirements for naval construction dropped below 60,000, and by the end of this year that figure will be less than 50,000.

There has also been a serious decline in skilled shipyard workers devoted to merchant ship construction. That sector of our business is now being exacerbated by short-sighted government policies that are abetting the exportation of comercial ship construction and repair opportunities. Compared to a peak of 35,000 workers building merchant ships in 1976, we anticipate that less than 10,000 will be so occupied by the end of this year. When coupled with the concurrent decline in naval shipbuilding, this means that some 50,000 skilled shipyard workers, and another 77,000 workers in supporting industries, have shifted their efforts from the essential task of building ships during the past seven years.

Further, this disturbing trend has and will continue to erode the capabilities of our country's smaller but equally important repair yards. Our shipbuilding yards, in their efforts to sustain economic viability, have begun to significantly increase their share of work in areas traditionally performed by the broader based repair industry.

In your previous hearing, concern was also expressed over schedule and cost performance of naval ship overhauls in the private sector. In this case, I fully confirm VADM Fowler's assessment that we have made substantial improvement over the past two years. But, an absolutely essential ingredient to this continuing trend is the availability of work. You cannot anticipate an immediate superior performance from a repair yard who has maintained a superior record in the past overhauling combatant ships with a level workforce of 500 men when that yard experiences a 12-18 month lull in available work reducing his employment level to less than 40 people. That very real example unfortunately is not an isolated case today. There simply has not been enough work to go around.

The issue here should not be concern for overtaxing the industrial base in the future. Given today's circumstances, it is difficult for us to even project such phenomena. Ambitious or not, what the Navy has proposed for new construction and repair will not, in our review, institute full recovery from the spiraling decline we are now experiencing.

If concern there should be, it must be concern for the absence of measures that must be taken to assure operational and workforce stability in U.S. shipyards—a volume of work that will ensure that this nation's essential shipbuilding and shiprepairing mobilization base will be maintained. We don't see the current Navy projections alone doing that.

Now, if I may, Mr. Chairman, I would like to call upon my colleagues for a more regional view of our concern. Thank you.

New England Ship Repair Association

STATEMENT OF JAMES HARVIE, PRESIDENT OF GENERAL SHIP CORP., AND A MEMBER OF THE NEW ENGLAND SHIP REPAIR ASSOCIATION

NAVAL SHIP MAINTENANCE AND MODERNIZATION

Mr. **Adamson**. Now, if I may, Mr. Chairman, I would like to call upon my colleagues to provide a more regional view of our concerns.

I will start with Mr. Harvie.

Mr. **Harvie**. Mr. Chairman and Senator Garn, I am James Harvie, president of General Ship Corp. and a member of the New England Ship Repair Association which is comprised of five ship repair firms in New England performing work on ships for the U.S. Navy.

I am pleased to have the opportunity to speak in support of the Navy's fiscal year 1983 budget request for maintenance and modernization of naval ships.

In the drive to build up our fleet to 600 vessels, maintenance of our existing vessel in the highest possible readiness must not be slighted. Our experience is that the Navy's funds for maintenance are closely watched, well managed and expended on work with is truly important to maintain the combat readiness and reliability. There are no funds in present Navy maintenance budgets for frills. I consider that the proposed level of maintenance funding for 1983 is an absolute minimum.

The Navy's maintenance budget goes further when ships are overhauled in private shipyards than in the public shipyards. Thus, it is important to maintain or enlarge the 30 percent of overhaul dollars allocated traditionally for private sector overhauls.

BUDGET REQUEST

The 1983 budget request allocates a proposed 34-percent share to less costly private yards, but a larger allocation would be cost effective and could be handled with ease by private shipyards.

Repair and modernization work to Navy standards requires substantial investment by private yards and a commitment to provide and maintain the management, systems, work force, and facilities which must be in place to perform the work on time and to high standards of quality.

Our yards have made the investment and commitment and we have performed, but opportunities must be provided for us to continue to exercise our capabilities. Factors which limit opportunities for New England shipyards, whose prices are among the lowest in the country, are the Navy's home port rule which requires that ships be overhauled in the area where they are based when adequate competition and capacity exists, and the fact that few ships are homeported in New England.

Current Navy planning indicates that some ships will be offered for coastwise bidding on the east coast which will afford the Navy the benefits of enhanced competition. In addition, our association urges that more ships be home-ported in Newport, R.I., where the combined benefits of low-cost repair work in our homeport area can be realized.

In summary, the shipyards in the New England Ship Repair Association support the Navy's fiscal year 1983 budget request for ship maintenance and modernization. The other actions which we advocate should afford the Navy enhanced means to obtain greater value from its budgeted funds.

Thank you for the opportunity to present these remarks.

[The prepared statement of Mr. Harvie follows:]

Prepared Statement of James Harvie, President, General Ship Corp.

Mr. Chairman and members of the subcommittee, I am James Harvie, president of General Ship Corporation, a member of the New England Ship Repair Association which is comprised of five ship repair firms in New England performing work on ships of the U.S. Navy.

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Thank you for the opportunity to present these remarks.

WESTERN SHIPBUILDING ASSOCIATION

STATEMENT OF WALTER A. LARSEN, CHAIRMAN OF THE BOARD, WESTERN SHIPBUILDING ASSOCIATION

REPAIR AND OVERHAUL OF U.S. SHIPS

Mr. LARSEN: Mr. Chairman and Senator Garn, I am Walter A. Larsen. I am chairman of the board of Western Shipbuilding Association, a coalition of industry and labor representing shipbuilding and ship repair yards, labor organizations, suppliers, subcontractors and other related segments of the maritime industry located on the Pacific coast and in the State of Hawaii.

We appreciate the opportunity to appear here today to express the views of our membership of Western Shipbuilding Association on the important subject of defense appropriations as it concerns the repair and overhaul of U.S. naval vesels in fiscal 1983.

We fully support and urge your approval of the $4.6 billion requested for funding of Navy ship repair, alteration and overhaul. The requested $2.9 billion ceiling on expenditures of these funds in public yards is, in our opinion, equitable.

As we have noted in prior years' testimony before this subcommittee, private ship repair capacity continues to be underutilized on the west coast. Commercial ship repair activities continue to decrease as more and more of our import and export cargoes move in foreign bottoms. Recently announced administration maritime policy that encourages commerical U.S.-flag shipbuilding and repair in foreign yards makes it appearent that the U.S. shipyard industry will now become more dependent than ever before on Navy work. This greatly increases the importance of an equitable allocation of Navy work to the private sector. Without this share of Navy work our private ship repair yards could soon be written off as an effective part of the Nation's defense mobilization base.

We are currently experiencing a period in our history in which unemployment is at one of the highest levels since the Depression days of the 1930's. A majority of the Nation's shipyards are located in and around some of the more depressed areas of the country.

The ship repair industry is highly labor intensive and a substantial percentage of its labor force is comprised of unskilled workers which represents a major segment of the Nation's unemployed. In addition, our industry complies with important Government work programs by providing employment for great numbers of minority and female workers.

We again strongly urge your approval of the $4.6 billion requested by the Navy Department for the accomplishment of Navy ship repair, alteration, and overhaul work in fiscal 1983.

Thanks again for the opportunity to appear before this subcommittee and present our views on this important subject.

[The prepared statement of Mr. Larsen follows:]

PREPARED STATEMENT OF WALTER A. LARSEN, CHAIRMAN OF THE BOARD, WESTERN SHIPBUILDING ASSOCIATION

Mr. Chairman, members of the subcommittee, my name is Walter A. Larsen. I am Chairman of the Board of Western Shipbuilding Association. Our Association is a coalition of industry and labor, representing shipbuilding and ship repair yards, labor organizations, suppliers, subcontractors and other related segments of the maritime industry located on the Pacific Coast and in the State of Hawaii.

We appreciate the opportunity to appear here today to express the views of the membership of Western Shipbuilding Association on the important subject of defense appropriations as it concerns the repair, alteration and overhaul of United States naval vessels in fiscal 1983.

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As we have noted in prior years' testimony before this Subcommittee, private ship repair capacity continues to be under utilized on the West Coast. Commercial ship repair activities continue to decrease as more and more of our import and export cargoes move in foreign bottoms. Recently announced Administration maritime policy, that encourages commercial U.S.-flag shipbuilding and repair in foreign yards, makes it apparent that the U.S. shipyard industry will now become more dependent than ever before on Navy work. This greatly increases the importance of an equitable allocation of Navy work to the private sector. Without this share of Navy work, our private ship repair yards could soon be written off as an effective part of the nation's defense mobilization base.

The Congress has recently provided for an increased rapid deployment capability. This capability must have additional logistic support to effectively accomplish its objectives. Historically, the U.S.-flag merchant fleet has been relied upon to provide this support. This fleet has long been considered the fourth arm of our military. However, the capability of our U.S.-flag merchant fleet has been decreasing over recent years, and the trend continues downward. This deficiency in sealift support capability cannot be corrected with short term solutions. We need to increase this capability now.

The private ship repair industry has earned its "essential" status, first, in serving as an all-important segment of the nation's industrial defense mobilization structure during some of our country's most trying periods, during World War II, Korea, Viet Nam, and others. And, second, in contributing to the nation's economic needs, also during times of adversity.

We are currently experiencing a period in our history in which unemployment is at one of its highest levels since the depression days of the 1930's. A majority of the nation's shipyards are located in and around some of the more depressed areas of the country. The ship repair industry is highly labor intensive, and a substantial percentage of its labor force is comprised of unskilled workers, which represent a major segment of the nation's unemployed. In addition, our industry complies with important Government work programs by providing employment for great numbers of minority and female workers.

We again strongly urge your approval of the $4.6 billion requested by the Navy Department for the accomplishment of Navy ship repair, alteration and overhaul work in fiscal 1983.

Thanks again for the opportunity to appear before the Subcommittee and present our views on this important subject.

NEW YORK-NEW JERSEY DRY DOCK ASSOCIATION

STATEMENT OF MICHAEL J. GALLAGHER, PRESIDENT OF THE NEW YORK-NEW JERSEY DRY DOCK ASSOCIATION

SUPPORT OF PRIVATE SHIPYARD REPAIR CONTRACTS

Mr. GALLAGHER. Mr. Chairman and Senator Garn, I wish to thank this committee for the opportunity to express the views of the New York-New Jersey Dry Dock Association concerning the fiscal 1983 defense appropriaton bill. The New York-New Jersey Dry Dock Association is a trade association of eight shipyards in the Port of New York-New Jersey.

The fiscal 1983 defense appropriations bill allocates $4.6 billion for repairs, alterations and conversion of naval vessels. The Navy has assured us that 35 percent, or some $1.75 billion, will be spent in the private shipyards. We urge you to support this portion of the bill.

Private shipyards in the United States are suffering tremendous economic hardships. In three decades, our country has gone from being the No. 1 maritime nation operating over 4,500 oceangoing vessels to No. 11. There are presently only 530 private, active U.S.-flag-operated ocean-going vessel.

In addition to the decline in the U.S. merchant fleet, 30 percent of the inland and 20 percent of the coastwise tug and barge fleet are inactive creating a tremendous loss of work to shipyards in the gulf and east coast. In New York Harbor alone two shipyards have gone out of business in 1981 and there is a likelihood of a major shipyard closing its doors this year. Without the opportunity to bid competitively on naval ship repairs more shipyards in New York would be forced out of business.

The members of the New York-New Jersey Dry Dock Association are concerned about the limited opportunity to bid on naval repair because of proposed naval homeport policies. As this committee is aware, there are very few naval vessels homeported in the Northeast. In recent years the Navy has allowed cross-district bidding enabling shipyards in the Northeast to participate. We urge this committee to have the Navy continue this practice.

On behalf of our members, I wish to thank you and your committee for your past support.

[The prepared statement of Mr. Gallagher follows:]

Prepared Statement of Michael J. Gallagher, President, New York-New Jersey Dry Dock Association

I wish to thank this Committee for the opportunity to express the views of the New York-New Jersey Dry Dock Association concerning the fiscal 1983 Defense Appropriation bill. The New York-New Jersey Dry Dock Association is a trade association of the eight shipyards in the port of New York-New Jersey.

The fiscal year 1983 Defense Appropriations Bill allocates 4.6 billion dollars for the repairs, alterations and conversion of Naval vessels. The Navy has assured us that 35 percent or some 1.75 billion dollars will be spent in private shipyards. We urge you to support this portion of the bill.

Private shipyards in the United States are suffering tremendous economic hardships. In three decades our country has gone from being the nunber one maritime nation operating over 4,500 ocean-going vessels to number eleventh. There are presently only 530 private active U.S. flag operated ocean-going vesssels. In addition to the decline in the U.S. merchant fleet, 30 percent of inland and 20 percent of the coast-wise tug and barge fleet are inactive, creating a tremendous loss of work to shipyards on the Gulf and East Coast. In New York harbor alone, two shipyards have gone out of business in 1981, and there is a likelihood of another major shipyard closing its doors this year. Without the opportunity to bid competitively on Naval ship repairs, more shipyards in New York would be forced out of business.

The members of the New York-New Jersey Dry Dock Association are concerned about the limited opportunity to bid on Naval repairs because of proposed Naval homeport policies. As this Committee is aware, there are very few Naval vessels homeported in the northeast. In recent years, the Navy has allowed cross-district bidding enabling the shipyards in the northeast to participate. We urge this Committee to have the Navy continue this practice.

On behalf of our members, I wish to thank you and your Committee for your past support.

CONCLUDING REMARKS

Mr. **Adamson**. That concludes our statements, Mr. Chairman and we wish to thank you for the opportunity to come forward and present our views.

Senator **Stevens**. Thank you. The comment I made about the overambitious program, that shipbuilding program is going up from $8.5 billion in fiscal year 1982 to $18.5 billion in fiscal year 1983.

Mr. **Adamson**. Yes, sir.

Senator **Stevens**. And that, along with a substantial increase in ship repair. My comment about overambitious is related as much to the dollar signs as it is to the ability of the industry to keep up with both at the same time.

Mr. **Adamson**. We understand that, sir.

Senator **Stevens**. Do you have questions, Senator Garn?

Senator **Garn**. No, thank you.

Senator **Stevens**. Thank you very much. We, too, question that homeport policy. I don't know what we are going to do about it, but I have severe questions about it.

Reserve Officers Association of the United States

STATEMENT OF MAJ. GEN. J. MILNOR ROBERTS (RETIRED), EXECUTIVE DIRECTOR, RESERVE OFFICERS ASSOCIATION OF THE UNITED STATES

FUNDING FOR RESERVE FORCES

Senator **Stevens**. Major General Roberts.

General **Roberts**. Good morning, Mr. Chairman. It is a pleasure to be with you this morning to discuss some of the aspects of the Reserve forces.

Let me start out by saying that I cannot understand why the Defense Department, faced with one of the biggest crunches they have every had in trying to expand in the face of economic difficulties, is not increasing the amount of funding for Reserve forces in percentages that make any sense at all. Every other major aspect of defense has increased, but the relative percent of funding for the Reserve is no more, and in fact a little bit less.

To further comment on that situation, last Sunday a week ago the New York Times ran a feature stroy about our defense plans as provided by the Department of Defense. Nowhere in this lead story did it even mention the term "Reserve forces," despite the fact that in the Army overy half of the combat elements would come from the Reserve and up to 70 percent of the combat support forces would come from the Reserve.

It is well recognized the the Rapid Deployment Force couldn't get away from the shore without Reserve participation. So in your consideration of funding for the Reserve request we suggest that at the very least you sustain what they have asked for from the administration and, as a matter of fact, increase it in certain areas.

I am sure you have our statement which I would assume will be put in the record. I just want to highlight a couple of points.

After the Army requested funding for 251,000 in the Army Selected Reserve the Defense Department reduced this request for end strength and full-time manning by $140 million. This doesn't make any sense at all. In fact, it is ridiculous for them to cut this particular section since within the first 30 to 60 days about two-thirds of the Army Reserve would be required for contingency plans and all of them within 90 days.

As a matter of fact, the Army Reserve units would be required far earlier than the National Guard because these units are the ones who get the people moving. Some of them would be combat but most of them would be service support, but they are the ones that would have to go first. There are units of the Rapid Deployment Force in the Army Reserve. Some of them didn't have the equipment they would require last year and the situation has been improved, but the equipment shortage in the Army Reserve is on an order of magnitude of about $4 billion versus a total of about $6 billion required for mobilization. So we suggest that the Reserve components need all the help they can get, as we always have.

With regard to the Individual Ready Reserve——

Senator **STEVENS**. If we get to this force reduction, as recommended by some people in connection with this budget control period, won't you get a substantial amount of equipment from those units that are reduced?

General **ROBERTS**. Well, we hope so, but that has not always tracked in the past. They might end up in Morocco or they might end up anywhere else in the world in foreign military sales. As a matter of fact, in the past they have taken away from Reserve component units the equipment they have had for this particular purpose. We would like to think so, but having been burned a few times we are a bit from Missouri on this. I hope you are right.

INDIVIDUAL READY RESERVE

Now I would like to highlight a couple of other points here. The Individual Ready Reserve of the Army is the most serious manpower problem we have in that they have currently about 200,000 in that pool and the requirement is on the order of 600,000.

The Defense Department has asked for a permission to extend the obligated period for youngsters going into the Army from 6 to 8 years, the last two being to help the Individual Ready Reserve. This would not require training on the part of those individuals but would keep them available as assets.

Also, they would like to institute an extended program of bonuses to retain people in the Individual Ready Reserve currently without this type of assistance. They have got about a 1-percent retention. But they feel that if they can pay them $300 for a re-up in the IRR that this would give them perhaps a 25-percent retention.

Senator **STEVENS**. One percent?

General **ROBERTS**. One percent, that is right. Well, you know, you take a youngster who has put in his time and he has got his 6 years over with and they don't give him a thing. What is the motivation to stay in the Individual Ready Reserve? It is just about zero.

I have in the past, when I was Chief of Army Reserve, suggested that they might even give them a lapel pin or a membership card or tell them they want them and call it the National Emergency Reserve or something to give it a little bit of prestige. Right now the term "IRR" means nothing except the first three letters of the word "irritate." You know, we have been talking about this for 10 years. Yet they have done nothing about it.

As a result, right now if you had a major emergency you would have to strip the divisions and the brigades of the National Guard to provide fillers for the active force. It is that bad. The IRR pool in St. Louis where they maintain it, has 200,000 folks, but that includes officers, NCO's and a bunch of senior grade enlisted. Well, that is another point and we don't have much time here.

NAVY TRANSPORT SECTION

I would like to highlight the requirement of the Navy in their transport section. The Navy depends on its Reserve for transport aircraft and they have had serious problems in maintaining the old fleet of C-118's. They have now gone to renting airplanes, excess planes from the airlines and we believe that is a good idea. It is not as good as getting some new ones.

We also would recommend that the Navy be permitted to purchase some C-9's from the manufacturer, becase if they don't do it soon the manufacturer will shut down his production line and you are going to be forced to rely on used circraft that are suitable but they are 12 to 14 years old. But they are leasing them on a lease-purchase arrangement right now and we suggest that you help them along this line and make sure they have the money for it.

The Navy has done a sharp turn, which we applaud. Instead of giving the Reserve forces hand-me-down equipment as has been done forever, this Secretary of the Navy, Mr. Lehman, and his CNO have now decided to give first-line equipment to the Reserve, both in the surface elements, the frigate program, and also in aircraft, and we applaud this. They are going from what they called vertical distribution, that is, the brand new to the fleet and then the castoff to the Reserve, to horizontal distribution where they are going to put some F-18's and A-6's directly from the manufacturer into the Reserve equally with the fleet. This won't be done at quite the same time element, but it is a step in the right direction and we support that program obviously. We think they have done a great job.

MARINE CORPS STATUS

The Marine Corps is possibly in the best shape, both from a strength point of view and readiness of many of the Reserve components, but they, too, have their problem. Not the least is a shortage of ordinary spare parts and equipment, which is easy to overlook, but has been neglected. We would suggest that you take a look at their request for this type of equipment so that the units, if they are mobilized, can in fact operate. It is one thing to have a unit, but without spare parts and the necessary repair equipment they can't go very far.

Also, the same policy that they are adopting for the Navy is being used for the Marines on giving them first-rate equipment which they badly need for the 4th Marine Division and Air Wing, the air elements in particular. The 4th Marine Division also needs upgrading on its equipment.

Equipment problems also apply to the Air Force where they still have some C-130A's that are obsolescent at best, and we need to improve that program with more C-130's in the late models. Also, they are talking about giving F-4's to the Air Force Reserve which are quite old and have an operating cost higher than the F-16, and we would like to see the F-16 go into the Air Force Reserve earlier than now programed because otherwise their equipment is obsolescent.

We would also comment from our testimony about special pay for physicians. We worked long and hard with you gentlemen and others to see that the active force physicians got special bonuses for retention purposes but they did nothing for the Reserve. There should be equal treatment, and we believe that this would partially solve the problem of the Army where they have about 30 percent of the physicians required in mobilization. Thirty percent isn't a very good figure, and we feel that this needs attention. Public Law 96-284 is a model which we hope would be followed for treatment of the physicians in the Reserve components.

PORTAL-TO-PORTAL PAY

Portal-to-portal pay is another thing that needs some attention. Senator Jackson has introduced bills S. 757, 785, and 759 which would take care of a Reserve component individual who happens to be injured on his way to drill or returning. Right now there is no obligation on the part of the Government. This we believe is an inequity which should be corrected and it would be a low-cost proposition. There restudies underway in the Defense Department right now and we believe at least two of these bills should be passed immediately to take care of this situation.

Well, gentlemen, it is difficult to cover all of the Armed Forces in 10 minutes and the Reserve components, and I think I have used about enough time, and I appreciate very much the opportunity to be with you.

Senator **Stevens**. Senator Garn.

Senator **Garn**. No. Thank you.

Senator **Stevens**. Well, you make good points and we, too, are looking very hard at the allocation of these resources. We appreciate your comments and we will do our best.

General **Roberts**. Thank you very much, Senator Stevens.

Senator **Stevens**. Thank you.

[The prepared statement of Major General Roberts follows:]

PREPARED STATEMENT OF MAJ. GEN. J. MILNOR ROBERTS, AUS (RET.)
EXECUTIVE DIRECTOR
RESERVE OFFICERS ASSOCIATION OF THE UNITED STATES

Mr. Chairman and Members of the Committee:

It is a pleasure to have the opportunity to appear before this Subcommittee for a presentation of the views of the Reserve Officers Association on some aspects of the proposed 1983 program for Reserve Forces. In view of the fact that the Department of Defense continues to place very great reliance on Reserve components, the status of their training, support, and structure are of vital importance as they affect readiness of these units.

The members of this Subcommittee are quite aware that pressures to maximize the efficient use of dollars devoted to defense are unprecedented, and those dollars which are devoted to the Reserve Components are some of the most cost effective anywhere in the entire defense structure. For example, the Reserve components receive only about five cents of every defense dollar in direct application, but Reserves make available approximately 30 percent of our Total Force. In the case of the Army, Reserve components supply over half of the combat units available upon mobilization and they also provide 70 percent of combat service support units. It is safe to say that there is no significant contingency which may confront this country which does not require fast and effective use of Reserve Forces.

In consideration of the above facts, we believe that this Subcommittee should examine provisions for the Reserve very carefully and demand answers to questionable budget shortages which adversely effect the efficiency of these units.

ARMY RESERVE

The Army Reserve Budget -- Fiscal Year 1983

The Congress has been requested to provide $1.954 billion in obligational authority to fund the Army Reserve's programs in Fiscal Year (FY) 1983. The following chart compares the Army Reserve budget request for FY 1983 with the last 2 years appropriations.

($ in Millions)

	FY 1981 Actual	FY 1982 Estimates	FY 1983 Request
Reserve Personnel Army	865.5	973.1	1,224.8
Operations and Maintenance	520.7	659.0	686.4
Military Construction	43.2	64.7	42.8
Total Program	1,428.4	1,696.8	1,954.0

ROA believes this to be a minimal amount needed to support the increased strength authorization and the expanded training program. In fact, we point out in subsequent segments of our report, the real need for additional funding to support training and upgrade equipment and facilities.

Army Reserve Personnel Strength

Although significant progress is being made in a continuing high priority program to bring Army Reserve units up to authorized strength and to retain qualified individuals in the units, problems also continue to exist. On the positive side, troop program unit end strength, which reached a low of 185,000 in FY 1978, has been increasing steadily since: 189,900 in FY 1979, 203,957 in FY 1980, 223,045 in FY 1981; and 241,000 in FY 1982. The FY 1983 strength request of 251,680 continues the upward trend, but still leaves the Army Reserve 35,000 short of wartime requirements.

ROA is concerned, and strongly opposes, initiatives undertaken by the Secretary of Defense to reduce the FY 1983 budget by $140 million, consisting of $80 million for Army Reserve paid drill strength, and $60 million for Army Reserve full time manning. We are indeed grateful to the Congress, for recognizing and rejecting this action which would have disasterous affects on recruiting, retention and training of the Army Reserve. We recommend enhancing the Army Reserve's percentage of the Total Army Budget, rather than reducing it, to offset the overall reductions being proposed.

Included in the budget request are monetary incentive programs supported by the Congress which will continue to be a significant tool in increasing Army Reserve enlisted paid drill strength, channeling of new members into high priority units for six years, and attracting qualified high school graduates to enlist in critical skill positions in any unit. In FY 1981 the program resulted in 5,580 soldiers enlisting for $1,500 cash bonuses and 3,490 enlisting for educational assistance of up to $4,000. ROA believes that the Congress should continue to support strongly this two-pronged bonus/educational assistance program which attracts qualified applicants who are upgrading the readiness status of Army Reserve troop units, at the same time this program helps improve retention.

Recruiting Needs

LTG Thurman, Deputy Chief of Staff for Personnel at a previous Congressional hearing, expressed satisfaction with the increase in the percentage of high school graduates recruited by all components of the Total Army.

However, although 71 percent of soldiers recruited in the active Army in FY 1981 and 63.7 percent recruited during the same period into the Army National Guard were high school graduates, only 61.4 percent of the 66,639 recruits accepted into the Army Reserve during FY 1981 were high school graduates. Since recruiting for the Army Reserve is under the auspices of the USA Recruiting Command, ROA is concerned with the apparent need to upgrade the quality of recruitment for the Army Reserve.

Full-Time Manning Support

The full-time manning program, as a part of full-time unit support, is an area of continuing concern which ROA believes needs greater attention. Although the program show material increases in full-time personnel from 821 in FY 1980 to a projected full-time manning strength of 3,588 in FY 1983 -- the Army Reserve historically has had the lowest percentage of full-time personnel supporting units among all service Reserve Components. In view of the very positive effect of the program on unit readiness and on the efficient use and management of Reserve resources, ROA recommends that an even higher priority be placed on correcting the deficiency by doubling the number of full-time unit support military personnel assigned to Army Reserve Units in FY 1983.

CAPSTONE Training Program

The CAPSTONE program has proven to be a most beneficial Army initiative. The program aligns Reserve Component units based on United States Army Europe's wartime requirements in order to develop a methodology that permits Active Component and Reserve Component units to train and plan in peacetime with the command they will deploy and fight with in wartime. This single initiative has focused training on wartime mission and has certainly improved Reserve Component readiness. We at ROA are very much concerned that this most important training program and others such as the scheduled Gallant Eagle Exercises which develop readiness to the sharpest degree, will be endangered by restricting the level of training travel funds needed to realistically implement the programs. ROA urges the Congress that current travel fund levels for training support be significantly increased in FY 1983 so that each unit has the opportunity to train with its active compoment unit at least once every three years. For those units with a Rapid Deployment Force mission, this readiness training should be budgeted annually.

Equipment

The FY 1981 overall equipment on hand status of the Army Reserve was 63 percent of the peacetime dollar value authorized, and 32 percent of wartime dollar value requirements (not considering M1 Tank requirements). The Army Reserve equipment status for selected items at the end of FY 1981 is shown.

ARMY RESERVE EQUIPMENT STATUS
($ IN MILLIONS AT END FY 1981)

Commodity	Required	Authorized	On hand	FY 1981 Issues All Sources*
Comm-Elct	$ 532,886	$ 261,527	$115,047	$ 6,149
Tank Automotive	3,338,236	1,445,673	927,166	30,257
Aviation	685,249	442,048	328,956	20,356
Weapons	575,654	318,482	254,591	8,006
Missile	63,907	31,663	5,767	195
Other	716,403	560,989	284,438	17,205
	$5,912,335**	$3,060,382	$1,915,963	$82,168

* Includes Procurement, Depot Maintenance and Redistribution.
** This figure excludes the requirement of the M1 Tank. If the M1 Tank was included, this figure would be $7,546,502.

Army Reserve units in peacetime must have, as a minumum, the essential level of equipment needed for training. Beyond that there must be an assurance that sufficient equipment will be available to Army Reserve units in time to meet deployment schedules and perform wartime missions, especially since 57 percent of Army Reserve units will be deployed within 30 to 60 days, and almost all within 90 days.

Total Army modernization must include the Army Reserve. It is vitally important that the Reserve Component forces are adequately modernized in order to be able to perform their missions in support of the Active Component. Fielding forces with incompatible equipment systems compounds the support mission problems for the Total Army. In addition, incompatible equipment systems require additional repair parts and related equipment to sustain the fighting forces required to meet contingency plan requirements.

NAVAL RESERVE

The Naval Reserve has made remarkable strides during the past three or four years with 1981 being the most productive year yet observed by RCA. These improvements cover the entire spectrum of strength, equipment, readiness and training. However, most impressive has been an attitude change by the Active Navy towards the Naval Reserve -- "One Navy" appears well on the way towards reflecting a meaningful relationship and no longer represents the hollow phraseology which many of us observed for too many years. This remarkable turn-around can be attributed to the outstanding leadership of the CNO, Admiral Hayward; the knowledgeable and dynamic direction being provided by Secretary Lehman; and the strong and consistent emphasis by the Congress concerning effective utilization of Reservists.

The recent acceptance by OSD of the NAMMOS methodology for determining manpower requirements represents another hallmark. A close reading of the OSD language appears to reflect some possible reservations for the future; accordingly, OSD actions concerning Naval Reserve manpower strengths must continue to be monitored closely to determine if the spirit of NAMMOS has truly been accepted. Nevertheless, Congress is to be highly commended for keeping the pressure on OSD either to accept NAMMOS or to provide a logical alternative.

The administration proposal for 94,000 Selected Reservists in FY 1983, exclusive of IMA personnel and TARS, certainly represents a significant improvement over the consistency of many years of strength reduction proposals. In fact, the current Navy plan calls for a Selected Reserve strength of 98,654 by FY 1987. Plans which call for increasing the size of the Selected Reserve towards the NAMMOS requirements are applauded by ROA. However, a look at the NAMMOS requirement for FY 1987 shows a wartime requirement of 121,187. In other words, the gap between the Navy plan and NAMMOS requirements grows from the current 18,400 to

22,533 in FY 1987 -- hardly the direction we should be going. This is particularly critical in view of the OSD Program Guidance which directs that the Services plan to meet all moblization manpower requirements by the end of FY 1986.

ROA concurs fully that quality should not be compromised for quantity. In no instance should personnel whose skills are not required for mobilization be brought into the Naval Reserve merely to reflect increased strength. Nevertheless, ROA believes that the Navy should move boldly towards planning to meet the stated NAMMOS requirements. To this end, however, merely authorizing and funding increased numbers may be insufficient. Many of the requirements are in medical related fields which are extremely difficult to fill. Another factor is the lack of "A" school seat availability which severely restricts the number of non-prior service "Ready Mariner" accessions. Expansion of the training base and development of incentives to attract needed, but scarce skills should be throughly explored.

ROA recommends that the Navy planning figures for the Selected Reserve reflect the OSD Program Guidance and to that end should project a constant growth towards the NAMMOS requirement of 121,187 by FY 1987. Therefore, along with the Naval Reserve Association, ROA recommends that a Naval Selected Reserve strength of 100,750, exclusive of IMA personnel and TARS, be funded for FY 1983. The Navy submission for FY 1983 requests a Naval Reserve strength of 105,500, an apparent increase of some 12,000 over FY 1982. However, this figure includes for the first time ever 550 IMA personnel and 11,500 TARS; so the actual FY 1983 request represents no increase in actual strength over FY 1982. (We will address this rather misleading accounting procedure later in our testimony, since it has been imposed by OSD and applies to all Reserve Components.) Accordingly, our recommended increase in Naval Reserve Selected Reserve strength to 100,750 would result in a total strength of 112,800 if IMAs and TARs are included. The additional cost over the submitted budget is estimated at $23.3 million ($11.7 million if the Selected Reserve strength is approved as end strength vice man-year average). We share the Navy's concern about attainment, but, nevertheless, believe that every effort, including those noted above, must be expended to prevent further widening of the gap between requirements and Selected Reserve strength.

A closely related and critical problem facing the Naval Reserve in the FY 1983 budget request is a continuation of reduced recruiting funding originally levied in FY 1982. The anomaly of reducing recruiting funds while at the same time increasing recruiting requirements is unusual, to say the least. The pressures to continue to increase the size of the Naval Reserve over the next several years, as we noted earlier, will probably continue. The immediate requirement is an increase of 7,000 personnel in the Selected Reserve. Nevertheless, the Chief of Naval Reserve will have an $1.89 million shortfall of funds for recruiting purposes in FY 1983. This total shortfall is about equally split between the O & M and RPN appropriations. For example, the FY 1981 advertising budget was $1.2 million, but for FY 1983 it is only $965 thousand. Even though this situation generally reflects Congressional guidance to cut back on recruiting costs during a period of higher unemployment, it still makes no sense! Recruiting advertising and contact efforts cannot be cut off and on like a spigot, depending on perceptions of the market. Private industry fully appreciates this fact. No matter how successful Coca-Cola sales are, for example, they maintain a constant or increasing level of advertising. To do less results in quickly dropping sales. The Naval Reserve is tasked to significantly increase "sales," while their advertising budget is being reduced significantly. ROA recommends that the Chief of Naval Reserve be provided an additional $1.89 million for recruiting, including an increased advertising amount of $540 thousand, for FY 1983.

In the area of hardware the most critical immediate need, which has been addressed repeatedly over the past few years, is the maintenance of an organic Navy tactical airlift capability. This need is codified in 10 U.S.C. 5012 (b) and has been verified repeatedly through Congressional hearing and through Navy and OSD studies. Old C118 aircraft are being phased out even more rapidly than planned because of repair and maintenance problems associated with obsolescence. There have been no replacements other than sporadic C9B "buys" in minimal numbers. The history of C9B procurement is a classic case of on-again, off-again procurement "sputter." 13 C9B aircraft are now operational; two were authorized and funded for FY 1980, but were deleted as a result of FY 1980 Supplemental and Recision action. Six were authorized for FY 1981, but only two were funded -- in essence the same two deleted for FY 1980. None were included in the FY 1982 Budget request, but both the House and Senate came to the rescue and authorized procurement of used "airline excess" C9s (twelve by the Senate, six by the House). However, Administration pressure directed to the Conference Committee resulted in the elimination of the entire C9 procurement for the Naval Reserve. A rather unusual and totally frustrating result, to say the least!

Maintenance of this capability is such a critical immediate need that the Navy has initiated action to lease used C-9 aircraft, starting in FY 1982, out of existing funding. ROA wholeheartedly commends the Navy for this initiative; however, such desperation action is only a "band-aid" at best. Further Congressional action and support is urgently needed.

The depressed state of the airline industry has made available used DC9s which are an attractive alternative to new aircraft. Use of these "airline excess" planes, however, results in a sacrifice in capability and longevity. A new C9B has longer range, greater flexibility, better cargo convertibility and obviously, much longer service life. Therefore, as we testified last year, ROA strongly supports used C9 procurement but deplores the expedient of such procurement to the exclusion of essential new procurement.

Accordingly, we have strongly urged that four new C9B aircraft with appropriate site support and spares be purchased and eight used C9 aircraft with appropriate site support and spare be lease/purchased in FY 1983. Maintaining at least a minimal flow of new C9B aircraft each year until the total requirement is met is particularly necessary in view of the fact that the manufacturer no longer produces this version of the C9 for civilian use. Without a demonstrated intention to continue such purchases of C9B aircraft for the Navy, production line realities will dictate significantly higher unit costs. However, neither the House nor the Senate have authorized procurement of new C9B aircraft for FY 1983. Accordingly, ROA strongly urges appropriation of $60.6 million, $44.4 above the Administration request, as authorized by the House, for lease, or lease/purchase of used DC9 aircraft.

The program to modernize the ASW capability of Naval Reserve land based patrol aircraft was provided significant momentum by the Congress is the FY 1981 Budget. This program, involving installation of a Tactical Navigation Modernization kit (TACNAVMOD) in P3-A/B aircraft, received no funds in FY 1980. However, in FY 1981 the Congress recognized the need to accomplish such modernization rapidly so that Naval Reserve ASW aircraft would be combat ready in the event of mobilization. Accordingly, Congressional action provided for installation of TACNAVMOD in 34 aircraft in FY 1981. The FY 1982 Budget request again ignored the need to accelerate this modernization and requested only 15 such kits. However, both the House and Senate recognized the need to maintain the momentum provided by the 96th Congress and authorized the modification of 36 P3-A/B aircraft for FY 1982. However, unbelievably, the entire TACNAVMOD package was deleted by the Conference Committee as a result of the aforementioned Administration insistence.

It is absolutely essential that the previous momentum be regained so that these Naval Reserve aircraft will possess the necessary mission capability upon mobilization. This is doubly true now since not only was an entire year of this vital program lost in FY 1980, but now another year has been lost because of FY 1982 budget action.

A total of 71 P3-A/B aircraft remain outside the modernization program. Originally, ROA did not believe it necessary to modify all of these aircraft since the on-going active Navy P3C procurement program would result in a steady flow of modified P3Bs to the Naval Reserve and up to 29 P3-A/Bs could be phased out without modification. However, the current Navy proposal to effect a fifty-seven percent slow-down in P3C procurement over the next several years drastically alters this conclusion. Accordingly, ROA strongly recommends funding procurement of 36 TACNAVMOD kits in FY 1983 at a cost of $170.2 million, an increase of $50.4 million over the $119.8 million requested by the Administration.

The need to upgrade and modernize Reserve equipment encompasses the entire spectrum of Reserve Missions. However, it is particularly critical in the Naval Reserve Carrier Air Wings. The capability of these Reserve Air Wings is unquestioned and has been constantly demonstrated. However, they are flying rapidly aging aircraft and the compatibility gap between these aircraft and those flown in the fleet grows wider at an alarming rate. This is particularly significant because the aircraft carriers to which these Air Wings would mobilize are becoming increasingly more specialized in their intermediate maintenance systems. Accordingly, there would be neither spare parts nor test-bench equipment on board to support the newly arrived Reserve aircraft. Greater compatibility between Reserve and Fleet aircraft must be achieved.

The time honored Navy practice of "hand-me-down" equipment for the Naval Reserve may have been effective at one time; but continuation of this practice has driven the Naval Air Reserve, in particular, almost to ineffective obsolescence. This fact has now been recognized by both the Secretary of the Navy and the CNO. They have publically renounced the doctrine of vertical integration and announced commencement this year of horizontal integration. The Navy intends to modernize the Reserve Tactical Air Squadrons as early as possible with the introduction of F/A-18 and A6E aircraft. ROA applauds this initiative and strongly urges the Congress to support the Navy in this long overdue and most essential effort. For several years; new production aircraft have been received in the Air National Guard and the Air Force Reserve. The Naval Air Reserve can afford no less.

MARINE CORPS RESERVE

As I testified last year, the Marine Corps Reserve manpower requirements appear to have been quite well provided for in the FY 1983 budget request. As General Crist testified earlier before this committee, most problem areas have been addressed and corrective action provided for in the budget request.

ROA compliments the Marine Corps on their continuing recognition of the Reserve component. The Marine Corps Reserve Budget has reflected real growth every year since FY 1978, showing ten percent in FY 1981; eleven percent in FY 1982; and 6.7 percent programmed for FY 1983. Such consistent support unfortunately has not been evident in many of our other Reserve components throughout the past few years. This support has enabled Marine Corps Reserve manpower planning to meet the OSD Program Guidance. Current plans show the Marine Corps Selected Reserve will be at one hundred percent mobilization required strength by the end of FY 1986 - an outstanding achievement!

Grade and skill shortages are commencing to emerge as significant problems in the Marine Corps Reserve. Initiatives have been undertaken by the Marine Corps to ameliorate these problems. As in the other Reserve components, however, Congress must provide additional incentives for Reserve recruiting and retention if these problems are to be solved. The Marine Corps Reserve recorded a dramatic increase (almost 250 percent) in First Quarter FY 1982 reenlistments resulting from a Congressionally directed increase in the education bonus from $2000 to $4000. Concomitantly, enlistment and reenlistment bonuses have been insignificant incentive factors - due primarily to insufficient amounts and requirements to pro-rate over the enlistment period.

The material readiness of the Marine Corps Reserve 4th Division/Wing Team is a matter of major concern. They simply don't have the necessary equipment, repair parts, consumables, etc., which they must have on mobilization. These kinds of items are always subject to quick deletion or reduction during the budget process because such action results in immediate cost savings. An already unsatisfactory situation was worsened even more by a ten to twelve percent reduction of these stocks to support the RDJTF Near Term Prepositioning Ships program. Unfortunately, the proposed administration budget does little to reduce the magnitude of this problem. The current shortfall is $684.2 million with a projected reduction to $653.5 million during FY 1982. The FY 1983 budget would only reduce the shortfall to $612.5 million. In fact, by FY 1987, the shortfall would still be $231.7 million. That figure is probably optimistic since experience indicates that matters of perceived higher priority continually arise and funds planned to reduce the stock shortage shortfall is diverted elsewhere.

Without an immediate effort to significantly reduce these shortages, the ability of the Marine Corps Reserve to perform effectively on mobilization is seriously in doubt and sustainability is out of the question. Accordingly, ROA strongly recommends that Congress take action during FY 1983 to rapidly accelerate the elimination of these shortages with a goal of total elimination by the end of FY 1985.

ROA strongly supports Marine Corps efforts to modernize the Reserve Ground Combat Forces. Current planning calls for the introduction over the next five years of the Mark 19 heavy machine gun; the Mark 198 howitzer; the lightweight 60mm mortar; the shoulder launched milti-purpose assault weapon (SMAW); and the high mobility multi-wheeled vehicle (HMMWV). We urge Congress to support these efforts and expedite this modernization process to the maximum extent feasible.

Much of what I stated earlier about the Naval Air Reserve applies equally to the Marine Air Reserve. The 4th Marine Air Wing is severely limited in its capability to augment and reinforce the active forces due to aging aircraft, aircraft shortages, incompatibility between active and Reserve aircraft and block obsolescence. Many Marine Air Reserve squadrons deploy to aircraft carriers upon moblization. The Marine Reserve aircraft would suffer the same lack of equipment support as would the Naval Reserve aircraft for the same reasons. Here again, we must start moving toward new procurement of identical equipment for both the Reserve and Active Duty Marine Corps.

As in the Navy, introduction of F/A-18 aircraft into the Marine Air Reserve should commence as soon as possible to replace aging and incompatible F-4s. The AV-8B Harrier should be procured for both active and Reserve Squadrons, replacing obsolete A-4E/Fs currently in the Reserve.

Congress has previously directed establishment of two Marine Air Reserve KC-130 aerial refueler/transport squadrons and further directed expedited procurement for this purpose. Four KC-130 aircraft were funded for the Marine Air Wing as add-ons by the FY 1982 Defense Appropriations Conference Committee. None are requested in the FY 1983 budget, therefore still leaving a total of 17 KC-130s to be procured to meet the Congressional mandate. ROA recommends procurement of four additional KC-130 aircraft for the Marine Air Reserve in FY 1983. However, since no such procurement has been authorized for FY 1983, the somewhat unusual procedure of last year may have to be repeated.

While there is a Marine Corps-wide critical shortage in AH-1 attack helicopters, the Reserve squadron only possesses eight of the 24 aircraft authorized. Current planning will bring the Reserve squadron to its authorized strength, but with aging aircraft. The urgent need is to increase the helicopter anti-armor capability to counter large numbers of mechanized and armored units which will be encountered on a high threat battlefield. Only the AH-1T (TOW) has an anti-tank capability. This is an ideal mission for the Reserve as the manpower, airfield and support facilities are available and the AH-1T requires 50 percent less maintenance than the aging AH-1J planned for the Reserve. Accordingly, ROA recommends that procurement of AH-1T helicopters begin immediately for the Marine Air Reserve and that the entire twenty-four aircraft Reserve Squadron be equipped with this helicopter as soon as feasible.

The Marine Corps has developed long range plans to upgrade the capabilities of the Marine Air Wing. The intent of these plans obviously is laudable. However, in almost all cases, they are far in the future and depend on too many variables. ROA strongly urges the Congress to immediately commence funding for this long overdue modernization program.

AIR FORCE RESERVE

The Air Force Reserve is in the best condition in its history since restructuring under Public Law 90-168. In FY 1981 it attained an end strength of 61,565 versus a programmed 60,754. Quality also increased by six percent, with 95 percent of all non-prior service enlistees high school graduates. The efficiency of the Reserve recruiting program as well as the dedication of all Reserve members is reflected in this accomplishment.

In FY 1983 an end strength of 66,000 is requested, a 5.5 percent increase over FY 1982. This reflects the military personnel requirements for aircraft modernization and additional flying and mission support units. It is gratifying to note that the Air Reserve forces provide approximately one-third of the total Air Force flying mission capability with only seven percent of the military personnel dollars. With the current pressures on the Defense Budget, it is obvious that the Air Reserve forces are a real bargain in the total force.

The Air Force Reserve is not only cost effective, it is a combat ready, fighting force. Exercise CONDOR REDOUBT 81 this past summer proved that all Air Force Reserve units can be mobilized in 24 hours and deployed within 72 hours. With the exception of five units undergoing aircraft modernization, all flying units are combat ready. The key to this superb state of readiness in meaningful missions, modern equipment, and realistic training.

The Air Force Reserve certainly has a full spectrum of meaningful missions, from airlifting more than 68,000 patients in FY 1981, to supporting the Space Shuttle mission, to officially saving 45 lives in rescue and recovery efforts. While much progress has been made in the second element, providing the Air Force Reserve with more modern aircraft, many problems still remain. The modernization of the Air Force Reserve's equipment must be looked at in the context of the modernization of the entire Air Force, since both the active and Reserve forces share the problems of block obsolescence and high operating costs of older aircraft. We ask, however, in looking at the force structure mix that the economics associated with Reserve Force equippage be considered.

We appreciate that Congress has recognized the need for modern tactical airlift aircraft in the Air Reserve Forces by adding 38 C-130H aircraft to the DOD budget since 1978. However, only six of these aircraft have gone to the Air Force Reserve. Even these six are two short of the number needed to bring the receiving unit up to minimum strength.

A systematic program for replacing the seven C-130A model units in the Air Force Reserve should be established. The average C-130A aircraft in the Reserve is just under twenty-five years old. Without a replacement program now, we will face a crisis in future years. We support funding C-130H aircraft to modernize the Air Force Reserve.

In the tactical fighter mission, the Air Force Reserve is building from eight squadrons in FY 1981 to ten squadrons in FY 1983. Five of these units will be equipped with F-4 aircraft, four with A-10's and one with F-105's. The F-105 unit is programmed to receive F-16's in FY 1984.

While the F-4's are new to the Air Force Reserve, they are old aircraft. In fact, the F-4's replacing the F-105's at Carswell AFB average 4,620 hours of airframe time compared to 4,460 for the units' F-105's. The average age of the Air Force Reserve F-4's exceeds twelve years.

The cost of maintaining and operating these aircraft is considerably higher than for the F-16. For example, the fuel cost for an active force F-16 squadron is approximately $5 million per year less than for an F-4 unit. Total operations and support costs are almost 22 percent less for an F-16 equipped wing compared to an F-4 wing.

As with the C-130A, a comprehensive program for the modernization of the Air Reserve Force fighters is necessary. General Creech has testified that, as presently programmed, TAC will lose more fighters through attrition, than it will procure. Obviously, the shortfall in first line combat aircraft will continue to increase unless additional new aircraft are procured for the total force, active and reserve. It is estimated that the procurement cost per Air Force Reserve F-16 squadron would average $300 million in 1982 dollars.

A program to modernize the total fighter force should include full equippage of Reserve Force squadrons with twenty-four aircraft rather than eighteen. Total force structure can be increased with minimal overhead increases by bringing Air Force Reserve squadrons to full strength. This principal also applies to the tactical airlift force where many uits could easily handle an increase in authorized and assigned aircraft.

The third element of Air Force Reserve success, i.e., realistic training for mobilization, is dependent upon the dedicated citizen-airmen. Without their talent and personal sacrifice, the best of equipment will not produce mission readiness.

We should not overlook the contribution of the Individual Mobilization Augmentees (IMAs) to the Total Force. These fully qualified individuals assist in the day-to-day mission of the Air Force while on inactive duty and active duty training periods. For example, intelligence IMAs support the Airborne Warning and Control System by analyzing Soviet electronic countermeasure systems. The IMA program is continuing to build with a requested average strength of 10,832 against a wartime requirement of approximately 18,615. This year increased emphasis will be placed on recruiting IMA's and bonuses will be used in selected enlisted skills.

Among the key personnel in maintaining mission unit readiness are the Air Reserve Technicians (ARTS). These dual status individuals provide the day-to-day management and continuity of their units while performing in their civilian capacity. As military members of the units, they train other Reservists during active and inactive duty training periods. The high skill level and stability of these employees is critical in sustaining the Air Force Reserve's operational readiness. We are concerned that the manning of this crucial program will suffer if the Air Force civilian ceilings are lowered, since the technicians are included in these ceilings. With the unit conversions to more modern aircraft scheduled for FY 1983, it is essential that adjustments be made to accomodate the requirement for increased numbers of technicians.

A related issue is the technicians "pay cap" imposed by the FY 1982 DOD Appropriations Bill. This restriction does not apply to other Federal Civil Service employees. To single out the ARTs, who perform two distinct roles for two distinct salaries, is unfair and sets a bad precedent. In the interest of maintaining mission readiness, provided in large part by these key management personnel, we urge the repeal of this counterproductive restriction. The money saved, $164,000 in the AFR, does not offset the damage done to sound personnel management and mission accomplishment.

Although programmed end strengths are being met, recruiting of qualified personnel in critical skills continues to be difficult. Current manning in the units in critical skills is 91 percent. With the FY 1982 incentive funds and the $2.9 million requested in FY 1983 for enlistment/reenlistment bonuses, recruiting and retention in critical skills should improve. The educational incentive program is another valuable tool in enlisting and retaining personnel with critical skills.

In summary, the Air Force Reserve's wartime role continues to expand. With continued equipment modernization and successful recruiting of the necessary people, the Air Force Reserve will continue to be a fully responsive, combat ready force.

CONCLUSION

I'd also like to mention an area of concern which applies to all of our Reserve Components. ROA noted last year that over unanimous service opposition, OSD had commenced incorporating fulltime support personnel and Individual Mobiliztion Augmentees into the Selected Reserve numbers. Such action appears to be clearly in violation of 19 USC 268 and 270 which specifically define the Selected Reserve and direct participation in at least 48 scheduled drills and 14 days of ACDUTRA each year.

Additionally, such procedure not only confuses all concerned by using existing terms for new definitions, but also artificially inflates Selected Reserve strength numbers, therby giving an erroneous impression of growth. OSD is still using this procedure and pointing to significant growth in the size of the Selected Reserve.

Much of this announced growth is merely the result of changing the bookkeeping and should not be viewed as significant growth in the "real" Selected Reserve. Such accounting procedures should be stopped, not only because of the apparent violation of statutory definition, but also because of the misleading impression of improved readiness resulting from such apparent strength increases. The House Armed Services Committee has directed OSD to submit a detailed report on this procedure which significantly increases the numbers in the Selected Reserve but which does not represent any increase in overall force manning.

ROA recommends strongly that the Appropriations Committees also take a careful look at this practice.

Portal-to-Portal Coverage

ROA supports legislation introduced in the Senate by Senator Jackson (S. 757, S. 758 and S. 759) that would provide so-called "portal-to-portal" protection for drilling Reservists. As you know should a Reservist become violently ill during a weekend drill, the Department of Defense is not authorized under current law to pay for his medical care. Should he be injured on his way to or from drill, again, he is not authorized military medical care. The inequity is readily apparent when you consider that an individual on active duty would be covered in the circumstamces just described. We urge Congress to rectify the current situation and provide these Reservists the proper coverage that they deserve for carrying out their military obligations.

G.I. Bill

ROA also supports legislation concerned with education which would improve quality and retention in both the Active and Reserve Forces. We are particularly interested in legislation that includes educational benefits for Reserve service, such as those contained in Representative Montgomery's H.R.1400 (with amendments) -- the improved "G.I. Bill". And we applaud and support Senator Chafee's Bill which would forgive certain civilian educational loans in return for service in the Armed Forces (S. 665). We believe it is important to look beyond today's excellent recruiting statistics. When the economy starts to improve, we'll have a recruiting problem. The benefits of a G.I. bill could help our Armed Forces -- Active and Reserve -- recruit and retain qualified personnel.

Retirement

ROA is greatly concerned over the Administration's proposals to once again change the method by which retired pay is adjusted to reflect increases in the cost of living. You are well familiar with the background: the elimination of the one percent kicker which had been added to compensate for lost purchasing power; the reduction from two adjustments a year to only one with the individual retiree absorbing the loss that had occurred during the previous calendar year; and now the Administration proposes using the lower of the future active duty pay raise percentage or the CPI increase, thus guaranteeing that the relative purchasing power of military retirees will decline in the future.

In addition to this proposal the Administration also recommends a cap on the pay raise of retirees so that their annuities are brought down to the level of annuities paid persons retiring under the latest pay scales. On first glance this appears to be fair; however, on closer examination we find that the reason such inversion exists is because previous Administrations had capped active duty pay and failed to permit it to keep pace with inflation. If the Administration is truly interested in fairness and equity it should propose a recomputation upward of those who retired prior to 1968 and thus did not benefit from the larger active duty pay raises that occurred in the late 60's and early 70's.

The two other proposals relating to retired pay, elimination of the lookback provision and the rounding down to the lower dollar, combine with the two provisions I have just discussed to convey a loud and clear message to the entire military community, both active and retired, that our government will breach its trust and, after accepting service rendered, will change the terms under which it compensates for that service. ROA believes that these proposals will have significant long-range implications, especially in the area of retention, and that the hidden costs of tampering with the military retirement system on a piecemeal basis should be thoroughly evaluated by the appropriate oversight committees of Congress before any changes are made in the current retirement program.

Health Care Personnel

As you are well aware, the 96th Congress enacted PL 96-284, which established special pay for active duty medical officers. We anticipate that this legislation will contribute significantly to the recruitment and retention of Health Care Professionals and thus reduce the shortages in this professional service. Unfortunately, the special pay established in PL 96-284 for active duty medical officers did not include the health professionals in the Reserve components where critical shortages also exist. Similar legislation is needed for the Reserve Forces health care personnel to overcome serious shortages in all the Services and to enhance their mobilization readiness. ROA believes that a special pay incentive program similar to PL 96-284 for the Reserve Components would help overcome one of the greatest obstacles in the recruitment and retention of qualified health care personnel.

Thank you for the opportunity to appear before you. Your support for the men and women in uniform, active and Reserve, is noteworthy and sincerely appreciated. I will be happy to answer any questions that you might have on these issues.

VALUE FOUNDATION

STATEMENT OF RICHARD ROYCE, EXECUTIVE DIRECTOR, VALUE FOUNDATION

VALUE PROGRAMS

Senator STEVENS. The Value Foundation.

Mr. ROYCE. Good morning, Mr. Chairman.

My name is Richard Royce, and I am the executive director of the Value Foundation. I would, if I may, Mr. Chairman, submit my statement for the record and I will talk from it rather than reading it.

The foundation is a nonprofit organization dedicated to the wider understanding and use of value engineering, value analysis and value management techniques. In some respects it would complement the work of the Government Procurement Relations Council of the Electric Industries Association and the Cost and Management Division of the American Defense Preparedness Association.

Let me state what value engineering is not, first, and then define it. It is not just "good engineering" as is often believed. It is not a typical cost reduction in that it does not focus on cutting the cost of the product, but it focuses on a functional analysis to achieve alternate ways of performing a function.

It is defined by the Society of American Value Engineers as:

> * * * the systematic application of recognition techniques which identify the function of a product or service, establish a value for that function and provide the necessary function reliably at the lowest overall cost. In all instances the required function should be achieved at the lowest possible life-cycle cost consistent with requirements for performance, maintainability, safety and aesthetics.

Although I am not an engineer, I have been involved with the discipline for something more than 15 years since I was staff director of the Senate Committee on Public Works under then Chairman Jennings Randolph. At that time in 1967 his committee conducted the first hearings on value engineering in the construction field in Federal agencies. Most of the work since that time in such agencies as EPA, the Federal Highway Administration and others has been largely the result of the initiative and encouragement that Senator Randolph gave in those many years. So I know what the discipline can do and I know how effective support from the Hill is in getting the agencies to perform it.

The DOD employs value engineering principally in two ways, in their in-house design review and in their contractor's program in acquisition.

It is sometimes used as a program requirement imposed on the contractor and it is also used as an incentive clause for the contractor to submit a value engineering change proposal, and that is the area in which I would like to focus my remarks and my concern.

The Deputy Under Secretary for Research and Engineering stated that DOD savings on the in-house work are about four to ten times what they are under the contractors' program. The figures ought to be reversed because they are dealing with much larger dollars in the development and production field than they are in the design.

VALUE ENGINEERING APPLICATION AT DOD

Two generalizations about the application of VE in DOD. First, the performance varies widely among the services. In the field of systems procurement the Army has the most active and effective VE program followed by the Air Force and the Navy in that order. The Army's audited savings from fiscal year 1977 through fiscal year 1981 have been $1.2 billion with a return on investment of 15.6 to 1.

Second, the overall effort in the Department is achieving about 5 to 10 percent of what it should according to our conversations with people in the defense community, both in the contracting field and within the Department itself. A 1977 report of the General Accounting Office Comptroller stated that "Savings in the past 2 years have amounted to less than 20 percent of DOD's assessment of the program's minimal potential." I don't think that that condition has been altered significantly for the better since then.

The goal today assigned in the Deputy Under Secretary's Office for savings servicewide is seven-tenths of 1 percent of total obligational authority, and they are not achieving that. This goal might be compared to the demonstrated record in the defense construction agencies, which have employed value engineering, the Corps of Engineers and the Naval Facilities Command, where their savings average about 5 percent of their total construction authority.

Now the area of the value engineering change proposal is that which I said I wanted to be the focus of my remarks. The receptivity of the program managers varies greatly when a contractor submits a proposal for a value engineering change, which saves money and improves reliability, performance, maintainability and often scheduling. The receptivity varies because there is no incentive for the program manager to change.

Value engineering always faces an obstacle because it makes people change their ideas and that is usually a painful process for most of us, and in order to do that there should be some incentive. Unfortunately, the Government program managers are led to believe, rightly or wrongly, that if they save money this year they are going to have less for their program next year. So it works against itself to get the kind of product that we are talking about in value engineering. They can be overcome and the program manager's resistance can be overcome only by top management support.

This administration has brought some new awareness to the contributions that VE can make, but it has not permeated above the Deputy Under Secretary level and it hasn't permeated very far down. I am here to encourage your subcommittee to give attention to this and to consider what the achievements have been. Last year they were about $500 million in fiscal year 1980. They should be about 10 times that, according to the contractors in the defense community who are active in this area. So we are not talking about small dollars.

Savings, of course, are not returned to the Treasury, but they can be used to fund other programs that are underfunded and they could, if the Defense Department really bore down on this program, make a significant difference in decreasing the rate of increase in our defense budget.

Thank you, Mr. Chairman, for this opportunity, and I will be prepared for any quesitons you might have.

[The prepared statement of Mr. Royce follows:]

The Value Foundation

PREPARED STATEMENT OF RICHARD ROYCE

EXECUTIVE DIRECTOR

My name is Richard Royce, and I am the Executive Director of the Value Foundation. The Foundation is a non-profit organization dedicated to the wider understanding and use of Value Engineering, Analysis and Management techniques as a problem-solving discipline.

Let me state first what Value Engineering is not, and I shall then offer a definition of what it is. It is not just "good engineering." It is not typical cost reduction, in that it does not focus on cutting the cost of the product by "cutting corners."

Value Engineering is defined by the Society of American Value Engineers as ". . . the systematic application of recognized techniques which identify the function of a product or service, establish a value for that function, and provide the necessary function reliably at the lowest overall cost. In all instances, the required function should be achieved at the lowest possible life-cycle cost consistent with requirements for performance, maintainability, safety, and aesthetics."

Briefly stated, the difference between Value Engineering and other cost-control disciplines is that VE is a disciplined analysis of the function of a product, rather than the product itself, and a search for alternate ways of fulfilling that function at less cost and with attention to maintaining the other qualities mentioned.

Though not an engineer, I have been involved with the discipline of VE for some fifteen years or more, since I was chief clerk and staff director of the Senate Committee on Public Works under then-Chairman Jennings Randolph. In 1967 that Committee held the first congressional hearings on Value Engineering in the field of Federally aided construction, and most of the VE activity today in such construction agencies as the EPA and FHWA stems from the initiative and encouragement of Senator Randolph.

Now, to address the question of the application of Value Engineering in the Department of Defense.

The DOD employs Value Engineering in three ways, with widely varying levels of performance and effectiveness among the Services and Defense agencies. It is used in-house by the Army to identify specific areas of value improvement which are then implemented to reduce costs and thereby improve value.

It is sometimes used in a contract as a requirement of a contractor; and third, VE clauses are also included in the Defense Acquisition Regulation to encourage contractors to recommend changes to contract specifications or to alter designs either to reduce costs or to improve reliability. It is this third method of application which I address this morning.

But before doing that, I would like to make two generalizations about the application of VE in the Department of Defense -- based on our observations within the Foundation and frequent discussions with Defense contractors and Value Engineering managers in the DOD.

First, as I earlier stated, performance varies widely among the Services. In the field of systems procurement, the Army has the most active and effective VE program, followed by the Air Force and the Navy in that order. The Army's audited savings from FY 77 through FY 81 have been $1.2 billion, with a return on investment of 15.6 to 1.

Second, the overall VE effort in the Department is achieving, according to the people in the defense community with whom we have spoken, some 5-to-10% of the potential savings. In a 1977 report of the General Accounting Office on the application of Value Engineering to major systems acquisitions, the Comptroller General stated that "savings in the past two years have amounted to less than 20 percent of DOD's assessment of the program's minimum potential." (Emphasis added.)

We in the Foundation believe that this performance record has not been significantly altered in the past five years. The present goal for DOD savings in the Value Engineering effort as applied to major systems acquisitions is seven-tenths of one percent of Total Obligation Authority, a goal which the Department is falling far short of achieving. This should be compared to the application of Value Engineering in the Defense construction agencies, the U. S. Army Corps of Engineers, and the Naval Facilities Command, where VE savings average about 5% of construction authority.

Though this Administration, especially at the level of Deputy Under Secretary of Defense, has given renewed attention to the potential contributions of Value Engineering, we believe there is still a missing ingredient. That is the commitment and active support of top management which would permeate through the Services to the individual program manager level. This could be encouraged by the Congress, and especially by your Subcommittee, Mr. Chairman.

The third area of application of Value Engineering which I said would be the focus of my remarks is that of the Value Engineering Change Proposal -- or the VECP, as it is known in the VE community. This is a change in the specifications, initiated by the contractor, usually in the latter stages of design development or in the production phase. The contractor risks his own capital in developing the VECP, and if accepted by the program manager, the costs are reimbursed and the savings are shared on a pre-negotiated basis between the contractor and the government.

These are audited and documented savings. To the contractor, they represent net profits. To the government, they represent a return on investment in the order of 9- or 10-to-1 in production costs, usually with additional collateral savings and improvement in performance and reliability. Each of the parties benefits, and benefits in quantifiable ways.

If this is so, then one must address the obvious question of why I am here this morning asserting that the discipline of VE, and especially the VECP, is under-utilized in the Department of Defense.

Perhaps the major reason that VE is not more widely utilized in DOD -- and elsewhere -- is that it requires people to change their minds. This is often a painful process for most of us. A VE analysis generates alternate ways to perform basic functions. In order to get the VE recommendations adopted, someone in the chain of decision makers must accept a new idea, and that is often difficult. It requires understanding and active support from the top-most managers.

With respect specifically to DOD, I have appended to my statement a verbatim quotation from Secretary Weinberger in response to a question on the under-utilization of VE in the Department which was put to him when he recently addressed the National Press Club. His response indicates something less than a complete understanding of the discipline.

That is not surprising, since the Secretary has heavy and wide responsibilities. However, the VE community was disappointed that Value Engineering was not included in the "32 Initiatives" of Deputy Secretary Carlucci, especially in light of its demonstrated record of achievement and its having been recommended, we understand, by the Army. It is worth noting, in passing, that Value Engineering is the only management discipline that goes outside the original scope of work to provide alternate ways of performing a function.

The reason that I have stressed the need for top management support is that at the present time most DOD program managers see little incentive to accept VECPs from Defense contractors. For if an acquisition program comes in below budget, the DOD program manager is led to believe, rightly or wrongly, that he will receive less funding the next time around. This reluctance of most program managers to accept VECPs from contractors can be overcome only by aggressive support from top management. Your Subcommittee, Mr. Chairman, can foster that support.

In addition to Secretary Weinberger's comments regarding Value Engineering, I have appended to my statement some description of examples of the actual products of some VECPs.

In closing, may I say that I would be less than candid if I failed to note that some of the Defense contractors have a bit of anxiety about raising this issue. Though the VECPs are profitable to them and save the government substantial sums as well as produce better products, some contractors are concerned that arousing congressional interest may result in what they term "micro-management." I do not believe that this need be so.

Consequently, we would be pleased -- if the Subcommittee desires -- to assist the committee staff in any way that you deem appropriate.

I am grateful for this opportunity to testiy and will welcome any questions you may have.

APPENDIX - I

VALUE ENGINEERING DIGEST

May 1982

Publisher's Pipeline . . . by Hal Tufty, CVS

We've always taken a positive instead of a negative-heckling approach when trying to explain and encourage VE.

As our readers know, we have been trying to get some top management support for VE from the Department of Defense over the years, during Administrations Republican and Democratic.

We've reprinted some encouraging letters and remarks from some very senior DOD people during the Reagan Administration.

Alas! When the Defense Secretary himself was asked the following VE question at the National Press Club where he was the luncheon speaker on March 8, 1982, the answer indicated less than "full top-management support," as we heard it.

We reprint the verbatim transcript of both the question asked by NPC President Vivian Vahlberg and Secretary Caspar Weinberger's answer:

Vahlberg: "Value Engineering is a discipline that has been underutilized in the Department of Defense for almost 20 years, yet, it regularly returns $10 for every dollar invested. What initiatives have you taken to extend the use of Value Engineering to control defense expenditures?"

Weinberger: "Well, I suppose there are several definitions of that. We believe that all of the management initiatives that we have initiated and in which Deputy Secretary Carlucci has played such an important and very large role, very able role -- I think that all of these management initiatives -- all of these attempts to determine -- why we need particular items -- and whether we need particular items -- and looking at the necessities and the values that we obtain from them -- (as opposed) in attempting to measure the priorities, all of these things, we think, are important to do.

"And the management initiatives include not only such things as multi-year procurement but far better budgeting, far better use of the Department's full resources, including the commanders (sic)-in-chief, as well as the Chiefs of Staff decentralization effort -- all of these things, we think, will contribute to the increased efficiency of the whole Department.

"On Value Engineering, specifically, I think that, again without attempting to get into too many of the various definitions of it, that we are adopting and are using many of the more accepted and approved parts of it."

My question to our readers is:

"What should we do?" -- Let me hear from you.

APPENDIX - II

VE=(IMPROVED PRODUCT)+(COST SAVINGS)

Value Engineering...
a formula that really works.

You don't have to search too far to learn the importance of value in today's economy. Just ask any shopper on her way back from the supermarket, and she'll tell you how much more she's spending to get less and less. Which is not to say that the supermarkets are to blame for the high cost of groceries. On the other hand, anything the supermarkets can do to cut their cost of operations — like installing more efficient checkout counters or moving to generic labels — will help shoppers put more food on the table.

The smart supermarket approach to provide bigger bargains at smaller costs also applies to the defense industry.

At a time when cutting budgets and improving productivity are two important national concerns, defense agencies need to get all the value they can from the products they buy. This is the *raison d'être* of value engineering — the discipline responsible for producing lower cost and higher performance levels in a program after a contract is awarded.

Armed services buyers began including value engineering as a contract requirement in 1959. They recognized they could best encourage contractors to find cost-cutting measures in a program by offering companies a percentage of the savings realized. This "share-the-wealth" philosophy was based on the rationale that new technologies, improved production processes and more efficient administrative practices often emerge after a project is already underway. If contractors are motivated to suggest these productivity improvements by submitting value engineering change proposals, both contractor and customer can profit financially.

And profit they have. From 1963 through 1980 the government saved over one billion dollars as a result of the Department of Defense Value Engineering program. The General Accounting Office estimates the program potentially could reduce federal agency costs by more than $250 million annually.

At first, value engineering seemed to impose a psychological barrier between customer and contractor.

After all, contract negotiation was supposed to be an adversary situation. It seemed too good to be true that anything could benefit both sides and result in mutual profit. Also, other people feared that value engineering changes might be interpreted as indictments of the customer or the original designers, rather than product reinforcement with technical and administrative improvements. Now, however, nearly all upper-level personnel in the services and defense companies are convinced that value engineering is a way to encourage the introduction of new technology. Not a fix for poor design or inefficient program management.

But not all the improvements involve injecting advanced equipment. Such elements as software and documentation are often candidates for savings. One missile program saved $100,000 from a value engineering suggestion to consolidate five independent but overlapping reports into one. That program was at Hughes Aircraft Company.

As with others in the industry, Hughes has long been committed to a strong value engineering program. As a result, for the last six years the Army Materiel Development and Readiness Command has recognized Hughes as the industry leader in value engineering.

Value engineers now function at every level of the Hughes organization... and on every major program.

To develop such a cadre of talent, Hughes has trained more than 2000 value engineers in company-sponsored classes in the past two decades.

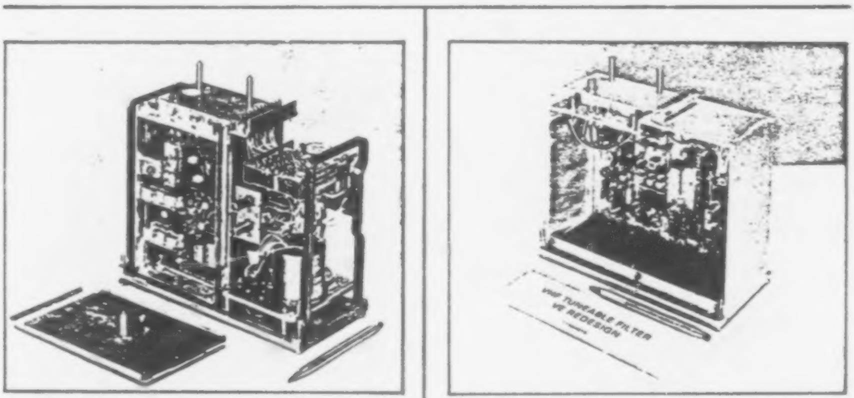
During that time, the Hughes value engineering program has produced a total savings of $400 million! That's more than enough to fund a brand new major program. With a return on investment to the customer of greater than 10:1, Hughes has firmly established the economic attractiveness of value engineering.

Dollars alone don't tell the whole story. There are other benefits.

Reduced use of materials, more reliable systems, improved performance, for example, make value engineering a tribute to industrial innovation.

As a benefit to the end user, one value engineering change implemented on the Hughes F-15 radar program replaced a 64-bit chip with a bipolar random access memory device. This switch in microelectronics brought about an 82 percent increase in reliability, a 58 percent reduction in weight and a $12.5 million life-cycle cost reduction for the radar signal processor.

For the contractor, the profit gained from value engineering savings is only part of the payoff. The more long-term gain is the experience the company accumulates when looking for — and discovering — improvements in productivity. Ultimately, the beneficiary is the taxpayer — who gets more product for less money. ❖



Value engineering, VE, saves costs and improves product performance — a fact attested to in these before and after VE photos of a component of the U.S. Roland mobile air defense system. The photos reveal how VE transformed the bulky, largely mechanical unit, top, to the relatively simple lightweight unit shown below — improvements largely attributable to recent advancements in integrated circuit technology.

A VE change proposal resulted in the elimination of a large servo motor and a gear train. The number of parts was reduced from 113 to 13. Power consumption was reduced by 37 percent. Unit weight was trimmed from eight to three pounds. These improvements resulted in reducing unit cost by a factor of four while unit reliability was increased by a factor of three.

Total government savings: $1.3 million in production costs plus $140 thousand annually in operating and support costs.

SERVICES RECORD ON USE OF VALUE ENGINEERING

Senator STEVENS. Which services use this value engineering more than the others?

Mr. ROYCE. The Army has the best program and the most active. The value engineering monitoring effort in the Army is within the Office of the Comptroller.

Senator STEVENS. Has your organization ever done any studies to indicate how much could be saved if these principles were used to their fullest potential?

Mr. ROYCE. The GAO has, Mr. Chairman. They are much better staffed to perform such a task.

Senator STEVENS. When did they do that?

Mr. ROYCE. Their last major report on major systems acquisitions was 1977, November, and Representative Larry Winn, ranking member of the Committee on Science and Technology, has asked for an update on that; the GAO is currently in the process of a review of the application of value engineering to the major systems acquisitions.

Senator STEVENS. Well, I am chairman of OTA. I will ask OTA to make a study and see what would be the advantage now of using value engineering to its fullest potential. We are certainly increasing our expenditures in this area and I don't think we ought to rely on a 1977 report.

Mr. ROYCE. Mr. Chairman, if I may give one example. I know of one contractor that over a 17-year period of submitting more than 500 value engineering change proposals generated savings, documented audited savings of about $450 million, of which the Government's share was in excess of $325 million and the profit, or the company's savings share, was $93 million.

Now the director of productivity of that company told me that it ought to be an order of magnitude greater, or 10 times.

Senator STEVENS. The staff will call on you after we have made the request to OTA and if they need to go to GAO they will.

Thank you very much.

Mr. ROYCE. Thank you, Mr. Chairman.

PROJECT ON MILITARY PROCUREMENT

STATEMENT OF DINA RASOR, PROJECT DIRECTOR, PROJECT ON MILITARY PROCUREMENT

ACCOMPANIED BY THOM LAWSON, PROJECT ON MILITARY PROCUREMENT

VIEWPOINTS ON MILITARY EXPENDITURES

Ms. RASOR. Good morning. I am Dina Rasor, the project director of the Project on Military Procurement, and I brought along Thom Lawson today because he did prepare the study that we would like to submit for the record.

Just to briefly go over the Project on Military Procurement, it is part of the Fund for Constitutional Government, which is a nonprofit, tax-deductible organization.

Basically we look at military expenditures from two points of view, one for the taxpayer and one for the user, the soldier, the person who is actually going to use the equipment on the battlefield. We work with a lot of people in the DOD, with a lot of former DOD people and consultants. What we try to do is bring forth what we think is an alternative viewpoint to the current spending activity in the Pentagon.

Today I would like to go over one area that we have generated a study on, and it is concerning the officer corps, mainly the senior officer corps throughout all the services. I would like to submit for the record a copy of our report called "Officer Inflation—Its Cost to the Taxpayer and Military Effectiveness," which we just recently completed.

OFFICER INFLATION

So I would like to, first of all, go into trying to define the term of "officer inflation," as we use it. What we did was look at 1939, which was considered a peace year, and 1945, which was considered a war year. During that time the United States had approximately 1 officer for every 12 enlisted men. Starting in about 1958 that ratio began to drop and now we have one officer for every eight enlisted men.

To keep that in perspective, the Germans during World War II had what was considered the most effective officer corps and leadership, and they had 1 officer for every 35 enlisted men. So you can see there is a rather large difference between that and our present situation.

If you also look at the inflation of generals per uniform personnel, it is even higher. In 1945, 1 general or admiral for every 5,900 men in uniform. In 1951, 1 general or admiral for every 3,000 men. Now it has gone clear down to 1 general or admiral for every 2,000 men.

You also have to look at each general officer as a command and you have to look at the command positions available. The figures that I have here in my testimony are rather dramatic and there are two reasons for it. One is because of officer inflation and the other reason is that we are buying less and less aircraft, ships, and planes because of the cost per unit.

For 1945 we had 1 Navy admiral for every 130 ships. In 1951 we had 1 Navy admiral for every 10 ships. It is now down to one Navy admiral for every two ships. In 1945, 1 Air Force general for every 244 aircraft. In 1951, 1 Air Force general for every 64 aircraft and in 1981 it is 1 Air Force general for every 21 aircraft. So you can see the command positions are shrinking, both the availability of commands and where exactly these commands are. When you are a general or when you are a colonel you are entitled to a command.

So we are concerned about this because there are several costs to this. One is very easily measured and that is, of course, the taxpayer cost of having officer inflation.

By the way, I want to say that this report was prepared completely with DOD figures and Congressional Budget Office figures, almost completely with the Government's own figures. So this isn't anything that we have made ourselves.

But each general and admiral received over $100,000 in salaries and benefits in fiscal year 1982 dollars, and when you talk about that it is in the sense that that is how much they cost the Government. And there is quite a bit of it, if you look in the report, that is nontaxable. But the Congressional Budget Office then did a comparison with the rest of the Government employees, the other GS ratings and Members of Congress and Cabinet members, and broke it down into disposable income. Now that is not going into benefits but just going into when you finally pay all your taxes and your health benefits, how much does everybody have to take home.

A one-star general has more disposable income than the Secretary of the Army, a lieutenant colonel has more disposable income than a Member of Congress, and a colonel has more disposable income than a Cabinet officer.

We need to back up, look, and think, what does this mean to the taxpayer. First of all, we have officer inflation. We have almost the same number of colonels now that we had in World War II. It never went down. It just stayed the same all the way across, and each one of those people has to be employed in a position. If a colonel has more disposable income than a Cabinet officer, you can see when you multiple that income, and I think it is approximately $14,000, that the cost is very high.

We have heard a lot about the fact that there is a problem with military pay, and maybe at the lower ranks of the enlisted men there is. But when you give an across-the-board increase you are exasperating this problem. In October 1980 the military had an 11.7 percent pay increase. In October 1981 for the officers it was a 14.3-percent increase and 10 to 17 percent for enlisted. I was very disappointed to see that in actual cases enlisted men would get less of an increase than the officer corps, because it is very obvious that the officer corps is highly paid at this point. Now they are talking about a 4 percent across-the-board pay increase.

You have to look at it, where is the money going. Well, when you have a 4 percent across-the-board increase, a lot of it is going right up to the officer corps again. I think if you look at the CBO figures, which are only about a year and a half old, you will see that compared to the rest of the Government in responsibility, the responsibility of a lieutenant colonel compared to a Member of Congress, the responsibility of a colonel compared to a Cabinet officer are quite different. I have been told by the service, well, we are on call 24 hours a day. I am sure Senator Stevens will say he is on call 24 hours a day as are a lot of Cabinet officers.

Now that is the cost we can measure. That is the cost we can look at and say that this possibly is a place we could cut to save money. You could either save money to reduce the Federal debt and put it in some kind of logistics or some are where we are hurting, but you can't really measure some of the other costs.

One of the costs that we are concerned about is related to why our weapon systems are taking so long to be decided upon. I am sure that the Congress has felt frustrated at times. You go to the DOD and you try to get an answer, and it takes forever for an answer to get back. That is because there are so many people in command, and you have memos and so much structure because each officer has to have a command and a staff. So we have memos going back and forth. I have had several Pentagon sources tell me that it often takes longer to decide what weapon to build than to actually build the prototype just because of this enormous memo passing.

But I think the most damaging effect of officer inflation is to our military effectiveness. What does it mean? It means that there are not enough command positions available for real command strategy, leadership, winning wars, which are what we expect our officers to do. As a result we put officers into positions that I think are demoralizing to them and in the fact take them away and encourage them to be promoted for reasons other than military reasons. We have budget officers that are generals, we have lobbyists that are generals, and we have PR people that are generals. Those jobs are not going to make a difference in the next war. We have to reexamine what we want our officer corps to do.

Do we want our officers to work on winning wars, teaching leadership and creating new strategies, or do we want them preparing budgets, lobbying for programs on Capitol Hill and wrangling with Government contractors?

One point I didn't bring up in the costs issue, and it is reflected in our report, is that once you get above the rank of colonel, or it might even be a little lower, but approximately the rank of colonel, the cost of replacing military people with GS people in the DOD is a lot cheaper.

So, in other words, do we have to have a major general that is head of public affairs among the services or should we have a civilian do that because that is a civilian-type job?

Edward Luttwak, who is a well-known military analyst, states the problem the best. He says:

> The military has become civilianized in the sense of emulating at higher cost, things the civilian can do better—but not concentrating on the things the civilians cannot do, which are to train combat leaders, to study tactics, and to prepare strategies.

Do we want our officers to be people that are going to concentrate on fighting wars, real wars, things that will make a difference? Being an officer should not just not be another job. Instead, I am afraid right now the emphasis is on being promoted, and fighting bureaucratic business and political wars.

Anyone who has attended or been involved with an Armed Services committee or your committee knows that when a weapons system or something is going to be discussed, there is an enormous amount of officers that show up. You usually wind up with colonels changing viewgraphs. I just don't think that that is the original intent of an officer corps and I think that when we come down to a war situation that a colonel who has spent most of his time changing viewgraphs is not going to be ready to lead men.

TOP HEAVY NATURE OF MILITARY SERVICE

So our conclusion is that the military service is becoming increasingly top heavy. In our report the DOD office says it is not fair to compare it to 1945 because that was a war year and we had a lot of enlisted men. So even though officer inflation began around 1951, we picked a base year of 1958 as a peace year. We weren't at war and we weren't building up for war, although that was a cold war time.

If you look in the report you will see that if we wanted to get back to those 1958 ratios, though I think the inflation started even earlier, you would have to retire quite a few people. I think that it is important.

So I think the taxpayers are paying more for their officers and actually getting less, less in the sense that we are supposed to be paying officers to be able to prepare strategy, lead men and get ready for if we have to go to war.

We hope that the committee will take a look at this, especially in light of the fact that DOD wants to expand the officer corps. Try to look at it again as to what do we want officers to do, what are their roles, what have they done in the past and what has been the percentage of officers per enlisted men in some of the most successful leadership situation, such as in World War II with the Germans.

This is the conclusion of our report. If there are any questions about it, I would be happy to answer them.

Senator **Stevens**. Thank you very much. We will review your report and we appreciate your testimony.

Ms. **Rasor**. Thank you.

[The prepared statement of Ms. Rasor follows:]

Project on Military Procurement

PREPARED STATEMENT OF DINA RASOR

DIRECTOR

Mr. Chairman and members of the Committee, thank you for the opportunity to appear before the Subcommitte on Defense.

The Project on Military Procurement is part of the Fund for Constitutional Government, a non-profit, tax-deductible organization. We are examining defense spending to see if the American Taxpayer is gaining increased security for his defense dollar. The Project is taking a serious look at HOW the defense money is being spent, WHAT we are getting for that money, and WHO is benefiting from large defense expenditures.

The Project's short term goal is simple: to bring spending abuses and ill-conceived weapon systems to the public and the Congress' attention. Our long term goal is far more complicated, but essential: to reform the military acquisition system to produce effective, reliable, and less expensive national defense.

The Project has recently completed a study on the Armed Forces officer corps, their cost to the taxpayer, and their contribution to military effectiveness. The statistics used in the study are mainly derived from DoD and other governmental sources. Today I would like to submit this report for the record and highlight some of our main findings.

Growing Number of Officers Per Enlisted Man

In 1939, a "peace" year, and in 1945, a "war" year, the U.S. had one officer for every 12 enlisted men. Since 1958, this figure has dropped to 1 officer for every 8 enlisted men-- a higher ratio than we needed to defeat the Axis powers. The inflation of Generals per all other uniformed personnel is even higher. In 1945 there was one General-Admiral for every 5,900 men in uniform, in 1951 there was one General-Admiral for every 3,000 men, and now there is one General-Admiral for every 2,000 men in uniform. To keep these numbers in perspective, you should note that the Germans during World War II had one officer for ever 35 enlisted men. The Germans were considered to have the best officer leadership during that war.

One result of this officer inflation is a shrinkage of command positions available. Consider the following numbers:

* 1945 -- 14 Army Generals per Active Division
1951 -- 24 Army Generals per Active Division
1981 -- 26 Army Generals per Active Division

* 1945 -- 1 Navy Admiral per 130 ships
1951 -- 1 Navy Admiral per 10 ships
1981 -- 1 Navy Admiral per 2 ships

* 1945 -- 1 Air Force General per 244 aircraft
1951 -- 1 Air Force General per 64 aircraft
1981 -- 1 Air Force General per 21 aircraft

Cost Of Officer Inflation

This officer inflation has a dramatic effect on several aspects of our military effectiveness. The easiest to document is cost. Cost of officers is far higher than their civilian DoD counterparts and many other government employees, yet often the officers are doing civilian work. In the study we outline many examples of how expensive our officer corps is, but today I would like to just list a few examples:

— Each General and Admiral receives over $ 100,000 in salary and benefits in FY 1982 dollars,

— A one-star General has more disposable income than the Secretary of the Army,

— A Lt. Colonel has more disposable income than a Member of Congress,

— A Colonel has more disposable income than a Cabinet Officer.

We have heard many stories about the problems of low pay in the military, but there is no pay shortage above the rank of Major. Therefore, when there are the annual across-the-board increases in military pay, much of that money is not going to reach the problem areas in lower ranks, but will continue to push officer salaries above that of their civilian counterparts. As manpower costs continue to rise in the DoD budget, other crucial budgets such as readiness and logistics are bound to suffer.

Cost Of Officer Inflation On Procurement and Efficiency

There are other less easily measurable effects of officer inflation on our military effectiveness. One important problem is the excessive number of commands and the resulting effect on procurement and decision-making.

Since each officer has a command and each has its proper channel to communicate with each other (usually via memos), decisions are much longer in the making. I have had several Pentagon sources tell me that it often takes longer to decide what weapon to build than to actually build the prototype. While this results in wasted time, money, and undelivered weapons in peacetime, such a slow down during war will place our soldiers in jeopardy.

Cost Of Officer Inflation On Military Effectiveness

Probably the most hidden and damaging effect of officer inflation is its cost to our military effectiveness. An overabundance of officers often means an underabundance of commands. This forces our military men into areas far removed from military missions-- often encouraging them to neglect their original mission of leadership and strategy development needed to win the next war.

We need to re-examine what we want to require of our officer corps. Do we want our officers to work on winning wars, teaching leadership, and creating new strategies, or do we want them preparing budgets, lobbying for programs on Capitol Hill, and wrangling with government contractors. Being an officer should not just be another job.

Edward Luttwak, a well know military analysist, states the problem well:

> The military has become civilianized in the sense of emulating at higher cost, things the civilian can do better-- but not concentrating on the things the civilians cannot do, which are to train combat leaders, to study tactics, and prepare strategies.

Reduction of the current officer corps will encourage the right caliber of officer to emerge and be promoted-- those intent on fighting and winning real battles, rather than bureaucratic, business, and political ones.

Conclusion

Since the end of World War II, our military services have become increasingly "top heavy." While this results in a large cost in terms of pay and benefits, the more important cost is the cost to the organization in terms of effectiveness.

We, as taxpayers, are paying more for our officers and yet are receiving less in terms of military effectiveness. The role and cost of our officer corps needs to be re-examined. Retiring many senior officers and the return of our officer corps to their original tasks are the best ways to help reduce the burden of federal spending on the American Taxpayer, while at the sime time encouraging a more realistic and effective defense of the United States.

Copies of the report, "Officer Inflation: Its Cost To The Taxpayer and Military Effectiveness," are available from the Project on Military Procurement.

ASSOCIATION OF CIVILIAN TECHNICIANS

STATEMENT OF JOHN T. HUNTER, NATIONAL PRESIDENT, ASSOCIATION OF CIVILIAN TECHNICIANS

ACCOMPANIED BY:

JOHN JOSEPH HERNON, NATIONAL VICE PRESIDENT, ASSOCIATION OF CIVILIAN TECHNICIANS

Senator STEVENS. John Hunter.

Mr. HUNTER. Mr. Chairman and members of the committee, as president of the Association of Civilian Technicians I would like to take this opportunity to express our gratitude at having been invited to testify on continuing the most appropriate and economical full-time support personnel, the National Guard and Reserves. Our organization has represented National Guard civilian technicians since 1960.

With your permission, I would like to submit a statement for the record and make a brief statement concerning the horror stories related to the Active Duty Guard and Reserve program, known as the AGR program.

Senator STEVENS. Your full statement will be printed. All of the statements will be printed in the record in full and we would appreciate it if you would summarize them.

Mr. HUNTER. Thank you.

I am accompanied by Mr. John Joseph Hernon, National Vice President of our labor organization. Due to time constraints it is obvious that we cannot relate to this committee each and every adverse effect created by the AGR program.

PROGRAM COSTS

We would like to start off with the high cost of the program itself. Mr. Hernon prepared the compilations in attachment No. 1 of our prepared text.

John, if you would explain the compilations, please.

Mr. HERNON. Attachment 1 to our prepared statement shows in the right-hand column savings resulting from the use of technicians, and at the top are overall cost figures. I would like to explain how we came to these figures.

We compared technicians when they were converted in their own position to AGR personnel. We took the individual technician, deducted his retirement and health insurance and tax costs and came up with a net pay. We then took the same individual when he was converted to AGR, took his military base pay, deducted his tax, social security, came up with his net taxable pay and then of course added his BAQ subsistence and variable housing allowance which is nontaxable. Our 38 positions show a difference biweekly of anywhere from $13 to $569.

ANNUAL AND SICK LEAVE COMPARISONS

We would like to make a comparison between AGR and technicians. On sick leave AGR gets unlimited. A technician gets 13 days a year. Annual leave, AGR 30 days immediately. A technician, 13 days, 20 days after 3 years and 26 after 15 years. Retirement, AGR goes out at 20 years and does not contribute, while a technician retires at age 55 and contributes 7 percent of his salary. On health benefits, AGR does not contribute. The present Blue Cross plan for technicians costs approximately $42 a pay period. Daily commissary privileges are provided for AGR but not for technicians. Free education benefits, again are provided for AGR but not for technicians. Quarters allowance, subsistence allowance, and variable housing allowance, all nontaxable, are provisions for AGR but not for technicians.

Our estimate attachment shows an average savings by using technicians of $9,000 a year. Our overall estimate in fiscal year 1983 if we used only technicians as opposed to AGR we could save a quarter of a billion dollars.

Mr. HUNTER. At an installation in Pennsylvania there are nine positions that are occupied in an overgraded capacity. When I say they are overgraded, I mean overgraded by the guidelines exhibits in a National Guard Bureau directive letter dated 12 June 1981 which is stated as the policies for Active Duty and Guard Reserve program.

Position No. 1 reflects a civilian technician, grade GS–9, step 4, technician salary $26,787, which includes his Guard drill pay. His military grade is a major with 17 years service. His military salary, that is his AGR salary, is $37,561. He is one military grade above and his difference in salary is $10,774.

Position No. 2, civilian technician GS–5, step 10, technician salary $20,299 with his drill pay. The military grade is an SFC E–7 with 27 years service; military salary, $27,780. He is one military grade over and his difference in salary is $7,481.

Position No. 3, civilian technician grade GS–5, step 10, technician salary $20,016. The military grade is a master sergeant E–8 with 19 years. His military salary is $26,578. This individual is two military grades over and his difference in salary is $6,562.

There are six additional positions, all one military grade over in the State of Pennsylvania with a difference in salary in each instance which is higher ranging from $2,500 to $8,000.

In addition, there is a case of a GS–7, step 10 technician in the State of Pennsylvania whose income was approximately $25,000, retired under the State plan and then returned to his original technician position as an AGR type technician. He was a chief warrant officer W–4 and now makes $35,000 a year plus his State retirement.

A technician in Illinois resigned her technician position to have a child. After approximately 18 months out of the technician program she returned to the unit as an E–6 tech sergeant and took an AGR position relating to GS–5 as a support services secretary. She held this position for about 2 years until a GS–4 position was posted in the operations section. After 10 days, the posting was cancelled. She was promoted to an E–7, which is a master sergeant in the Air National Guard, and moved over to the GS–4 position in operations.

It is interesting to note in this situation that the supervisors above her, one GS–8 and a GS–7, and all are civilian technicians, one is a chief master sergeant and one is a senior master sergeant, and she takes home more pay than both of these gentlemen.

There is another civilian technician in the State of Illinois who is an aircraft mechanic, F-6, WG-12. The individual had many problems with excessive tardiness because he had an outside business of running a tavern. To avoid being terminated he quit his position. He was told by the unit commander that he should never look to come back because he would never be hired. He has returned since, returned in the same position as an aircraft mechanic. He is now an E-7 after 7 months back on the job.

Since the MCR report showed no significant difference in the quality of new personnel coming onboard as AGR or technicians, I would like to read from a position description of an electronics mechanic air technician within the National Guard. This particular position I am going to reflect on, encompasses the statement within this position which is basic in the vast majority of the maintenance technicians in the Air National Guard.

The remarks column on the optional form 8, which is the cover sheet for the position description, states:

> The incumbent is subject to uncommon tours of duty, rotational shift assignments and overtime duty for which compensatory time off will be granted. He may be required to fly in military and commercial aircraft for TDY purposes. The incumbent must be assigned to a compatible military position in one of the following MOS/AFSC specialties. AFSC as noted.

Under duties and responsibilities, which is other than his normal electronics maintenance responsibilities, under paragraph 5,

> He prepared for and participates in various types of readiness evaluations such as ORI's, IG's and UE inspections.
>
> "MOBILITY AND COMMAND SUPPORT EXERCISES"
>
> He may be required to perform such additional duties as structural fire fighter, aircraft fire, crash rescue duty, security guard, snow removal, munitions loading and handling, heavy equipment operator, maintenance of facilities and equipment or serve as a member of a team to cope with national disasters or civil emergencies.

UPWARD MOBILITY IN TECHNICIAN PROGRAM

Mr. HERNON. I would like to illustrate how AGR affects upward mobility in the technician program. We have been told that a mix of technicians and AGR is the solution to our present dilemma. I would like to show you how this mix works.

Two jobs were advertised in the State of New York as technician vacancies at approximately the same time, last April of this year. One was a training technician GS-9 in the 242d Signal Battalion and one was a military personnel technician GS-8 First Brigade 42d Infantry Division.

Both technicians and AGR personnel applied for the jobs and in each case an AGR person was selected. Since these were technician vacancies it was assumed that the individual would revert to technician status, but both requested to take the job as AGR.

The State Technician Personnel Office of Lt. Col. Richard Beck approved their requests. A complaint was filed by Mr. Fred Young, State chairman in New York and he was told by Colonel Beck that AGR and technician positions are interchangeable. Since then we have been notified that they have also exchanged a wage grade 8 position for a wage grade 5. Again, the technicians are the losers.

This has removed three higher paying technician positions from the technician force, curtailed upward mobility and had a devastating effect on technician morale.

Since NGB is pushing AGR, it would behoove a State to select AGR positions in all such situations. It is now a practice in New York to enter on all technician announcements the statement "this position has the potential to be filled via AGR as a result of this announcement." This statement was not on either of the two advertised jobs. It is easily seen from the evidence that New York State has now decided to destroy the technician program. A mix in this program will not work because NGB is stacking the deck against the technician.

Mr. **Hunter**. Mr. Chairman, just prior to coming in this morning I received a call from a technician at an installation in the State of New York. It was an Air Guard installation. It was an AGR member who came in about 6 months ago filling a GS-6 position. He holds the rank of an E-7. He is a retired city fireman.

The individual was just recently moved, without any type of promotion and without any type of posting, into a GS-8 position. Now he is supervising approximately eight technicians. No posting, again, as Mr. Hernan stated, knocking down the upward mobility for technicians who have been in that supply section for upward of 22 to 24 years.

[The prepared statement of Mr. Hunter follows:]

PREPARED STATEMENT OF JOHN T. HUNTER
PRESIDENT

ASSOCIATION OF CIVILIAN TECHNICIANS

Mr. Chairman and members of the Committee:

As President of the Association of Civilian Technicians I would like to take this opportunity to express our gratitude at having been invited to testify on continuing the most appropriate and economical full-time support personnel for the National Guard and Reserves. Our organization has represented National Guard civilian technicians since 1960. With your permission, I would like to submit a statement for the record and make a brief statement concerning the horror stories related to the Active Duty Guard and Reserve program (AGR).

I would like to go into a brief history of how we got to the current AGR program. On the floor of the House of Representatives on June 30, 1977, Section 856 of the Department of Defense Appropriations Act, 1978, was struck and the remaining sections redesignated accordingly. Section 856 of the bill would have removed funding for future hiring of civilian technicians of the National Guard or any similar civilian technicians employed in support of any other reserve component as defined in Section 101 of Title 37, USC, after September 30, 1977. House Report 95-1398 directed the DoD to conduct a test of whether or not reserve component military personnel on active duty could successfully be hired to replace dual status technicians. The DoD results were to be reported to Congress by December 31, 1980. The Departments of the Army and Air Force conducted the test and submitted their reports to the office of the Deputy Assistant Secretary of Defense for Reserve Affairs in September 1980. Management Consulting and Research, Inc. (MCR) of Falls Church, Virginia, was awarded the contract to analyze and summarize the reports and assist the DoD in preparing the report for Congress. A summary of the report findings are as follows:

1. None of the components achieved a conversion that was representative of the General Schedule (GS) and Wage Grade (WG)

distribution of the present technician force. All components reported difficulty in converting WG positions and expressed doubt about being able to convert those without added incentives.

Obviously these technicians converting from their GS position to active duty status did so to increase their annual income. Please review attachment number 1 at the end of this statement and you will readily see the difference in total yearly income between the federal and active duty pay.

2. None of the components reported any measurable change in unit readiness due to the conversion test but the Air Force expressed concern about possible future impact of unfilled vacancies.

Senate Report 1446 which accompanied S-2865, the National Guard Technician Act of 1968, clearly states:

> "Technicians are required to hold concurrent National Guard membership as a condition of their civilian employment. The concept of the technician program is that the technician will serve concurrently in three different ways: (a) perform full-time civilian work in their units; (b) perform military training and duty in their units; and (c) be available to enter federal service at any time their units are called."

Therefore, any statements made by the National Guard Bureau regarding enhancement of unit readiness are false. The 1968 statute, PL 90-486, already provides for concurrent military membership; therefor, there is no increase in unit readiness by a civilian technician converting to AGR, but there is an increased burden to the taxpayers of this country.

3. Indicators of the quality of new personnel and of their job performance showed no significant difference between the dual status technician and full-time military personnel. There was no appreciable difference in attrition experience.

I would like to take excerpts from the National Guard Regulation (NGR) 600-5 dated January 15, 1982 and the Air National Guard Regulation (ANGR) 35-03 dated April 1, 1982.

ANGR 35-03, paragraph 3-3a (1)-(3), Eligibility Requirements, states:

> "To be eligible for assignment to a military duty position, the applicant must:

> (a) Apply for a vacant position on the Full-Time Manning Document (FTMD).
>
> (1) The applicant's military grade cannot exceed the maximum military duty grade authorized on the FTMD for the position.
>
> (2) Officers must meet, as a minimum, the entry level AFSC qualification criteria outlined in AFR 36-1 for the FTMD position."

At present, there are many AGR personnel overgraded in technician positions within the Air National Guard. It would be very difficult for an individual not to be able to qualify for entry level AFSC or 3-level AFSC. These are extremely low standards.

NGR 600-5, paragraph 2-2, Eligibility Requirements, sub-paragraph (d)(2) states:

> "(2) Enlisted personnel in grades E-6 and above should be qualified in the duty Military Occupational Specialty (MOS) of the position for which they apply. Individuals in grade E-5 and below may be assigned conditionally, pending the successful completion of supervised on-the-job training (SOJT), on-the-job experience (OJE) or appropriate MOS schooling for the award of the required MOS in accordance with NGR 600-200."

At this point, I would like to take a quote out of a letter from the Chief, Office of Policy and Liaison, National Guard Bureau dated April 12, 1982 and sent to Sen. Mack Mattingly (R-GA):

> "A military member in grade E-6 and above must be fully qualified in the MOS compatible with the position before being considered."

There is quite a disparity between the words should and must! Again Congress gets a "snow job" regarding the qualifications of personnel entering the AGR program.

4. There was not much difference between the two groups in responding to survey questions about job satisfaction and morale. Concern was expressed by both groups about the uncertainty of the future of the technician program.

The morale issue should be addressed. It would be high for the AGR personnel, due to increased pay and benefits, reemployment rights, free medical and dental, 30 days leave upon entering the program, daily use of military commissaries, etc. As for the career civilian technician - his morale has hit rock bottom. He is uncertain about the future of his civil service status, many upward mobilization positions have been given to the AGR, his income is fully taxed, he contributes to his retirement, he pays for his medical coverage, etc. What kind of on-the-job morale would an employee expect when he provides two employees with different pay and benefits to perform the same duties?

5. Little information was provided in the component reports about the specific impact of union activities or "unionization of the military." The report also stated that although various issues related to technician union activities were cited by the Defense Manpower Commission and the House Appropriations Committee, there were no specific examples of union interference with military activities or unit readiness cited by any of the components.

Since January 1969 to the present day, National Guard civilian employees have been represented by federal employee labor organizations. If you review attachment number 2 you will observe that their were 48 military call-ups from March 1970 to August 1981 to support various states concerning miscellaneous issues. At no time during these call-ups, or for that matter any other call-up, did these labor organizations interfere with the military activities or unit readiness.

6. All of the components except the Air Force Reserve express concern about meeting increased requirements for full-time unit support in the face of personnel ceiling constraints and hiring freezes. All except the Air Force Reserve saw some value in the use of active duty military personnel to overcome these constraints.

On May 13, 1982, Maj. Gen. Richard Bodycombe, Chief of the Air Force Reserves, gave the following testimony before this subcommittee:

> "As you know, one of the main reasons we have been so successful in maintaining readiness in the Air Force Reserves is our Air Reserve Technician (ART) program. These dual-status individuals perform in both a civilian and military capacity in their units. During the week, they provide day-to-day management and administrative continuity. During active and inactive duty training periods, they perform as military members of the unit, responsible for the training of the other reservists. The high skill level of this

> technician force, coupled with the stability of these employees are two factors critical to sustaining our operational readiness. This stability is one of the major reasons we have been able to attract and retain individuals who possess the highly technical skills needed to insure such readiness.
>
> However, we could experience difficulty in expanding our roles and missions if the Air Force civilian ceilings are lowered, since our technicians are included in these ceilings. Consequently, we strongly endorse Air Force ceiling adjustments to accommodate the use of technicians."

We fully support General Bodycombe's philosophy and also strongly endorse both Army and Air Force ceiling adjustments to accommodate the continued use of civilian technicians. Not only does General Bodycombe completely and unequivocally support his civilian technician workforce, but he addresses the real issues of ceiling adjustments to accommodate the civilian employee end strength.

7. With regard to cost analysis, the ARNG, USAR and AFR analyzed the cost of only the converted spaces. The ANG costed a conversion of the total technician force. All components except the AFR estimated dual-status technicians as being more expensive.

I am suspect of the entire analysis of costing at this point. How can one agency subdivision, the Air Force Reserve, find the dual-status technicians less expensive to the government and all other components, who desire the AGR program, costed the dual-status technician program as being more expensive? Obviously, someone in DoD should have examined their cost analysis. It certainly appears to me that the AFR is doing a better job of handling their civilian technician funding allocations as shown in attachment 1.

8. Each component had a somewhat different recommendation with regard to continuation of the conversion program:

The Air Force Reserve was opposed to any conversion and would like to convert their military spaces back to dual-status technician positions.

The Air National Guard was opposed to conversion generally, but would like to be able to fill some positions with full-time military.

The Army Reserve was in favor of conversion generally, but would like to be able to fill some WG positions with dual-status personnel.

The Army National Guard would like to convert their full-time support force to a military one.

In 1967, General Winston P. Wilson, then Chief of the National Guard Bureau, spoke to the Senate Armed Services Committee on the technician program, stating:

> "I hardly need to tell this committee that the splendid showing of the National Guard in its mobilization for service in Korea and Berlin was due in large measure to the competence of its full-time technicians. Our year-round support of the Active Army and Air Force in the air defense of the United States is provided almost entirely by these men. Our Air National Guard has provided significant support for the Southeast Asis operations and is currently assisting in refueling fighter aircraft on a year-round basis stationed in Europe. Our planes would not fly except for our own technicians. As of June 30, 1967, we had 40,241 technicians-23,758 in the Army National Guard and 16,483 in the Air National Guard - distributed throughout the several states, Puerto Rico and the District of Columbia.
>
> The technician occupies a position without legal parallel. His daily civilian tasks are closely related to his duties with his unit when it is ordered into active federal military service. He must be a member of the National Guard in order to be employed as a technician, and his career as a civilian employee depends on maintaining that military status." (First Session on HR-2,10/2/67)

At the same hearing, this statement was read from General James F. Cantwell, president of the National Guard Association:

> "In respect to title II of HR-2, we urge its unqualified support by this committee. It represents many years of effort by the states and the National Guard in seeking to establish a uniform retirement system and related benefits for an almost forgotten group of individuals, that is, the federally paid civilian employees - technicians - of the National Guard. The contributions of these individuals to the effectiveness of the National Guard has been long recognized.
>
> These, as you know, are the full-time Guardsmen employed in civilian status who keep

> our aircraft flying, our tanks, weapons, vehicles and other equipment in serviceable condition. It is they who enable us to operate our supply system, our armories, air bases and other facilities on the full-time basis that a modern reserve force requires. They are the men who give us the day-to-day continuity that is so essential to a highly ready, almost immediately responsive reserve force."

And on May 23, 1967, Maj. Gen. R.C. Kendall, Montana Adjutant General, sent a letter to Sen. Mike Mansfield (D-Mont.), which included these paragraphs:

> "These technicians are Army and Air National Guard members, who also are those full-time civilian personnel, who maintain the equipment, aircraft, weapons systems and carry out the day-to-day administrative continuity which is so vital to maintaining a ready, viable, reserve force. The present unprecedented high state of readiness of our National Guard units is positive evidence of the effectiveness and energetic dedication of this group of public servants. This bill will correct an inequity, which for many years has denied them their right to participate in a retirement system.
>
> I can assure you that a trained, combat-ready unit cannot be maintained without the retention of our career technicians, who have the technical skills and ability to maintain complex equipment and installations, and train recruits and prior service personnel in the maintenance and operation of aircraft, tanks, missiles, radar and numerous other highly technical fields."

Obviously there has been much support for the civilian technician program from the National Guard Bureau and National Guard Association prior to 1969. From 1969 to the present, the only change in this program has been the rights of these civilian technicians to join federal labor organizations of their choice if they desire to do so. Clearly, the threshhold reason for the AGR program is to circumvent union representation for technicians.

9. MCR's analysis found no significant difference in the cost to the government between the current dual-status force and one converted to full-time military personnel. However, recent military pay increases and the adoption of a Variable Housing Allowance will increase costs for full-time military personnel. Additional costs will be incurred in varying degrees depending upon the manner in which a total conversion is carried out as pointed out in attachment number 1.

On page 2 of his May 6, 1981 statement, Maj. Gen. Francis S. Greenlief (Ret.), executive vice-president of the National Guard Association of the United States (NGAUS), points out:

> ".....in addition, those unit commanders who urge conversion are convinced that

> commanders can only achieve full control of their full-time force if the full-time personnel serves in a military status."
>
> "The application of Title VII of the Civil Service Reform Act to the National Guard technician program takes control out of of the hands of the states, out of the National Guard Bureau and gives final control of technician personnel to the Federal Labor Relations Authority."

The NGAUS is a lobbying organization of which the full membership of commissioned officers in the National Guard must maintain membership in order to progress up the promotion ladder within the National Guard. Gen. Greenlief is a previous chief of the National Guard Bureau. It is interesting to note at this point that membership in this organization is mandatory for National Guard officers only, but on the other hand membership in the federal labor organization representing National Guard civilian employees is voluntary. If you compare the two organizations, you find the NGAUS is a "closed shop", requiring mandatory membership, while the federal labor organizations are "open shop".

Congressional interest in the Defense Manpower Commission (DMC) report of 1976 prompted the DoD to conduct a review of the reserve components full-time support problems. The study was conducted in 1977 by a DoD task force under the direction of Maj. Gen. Francis Gerard. The Gerard study recommended the retention of the technician program provided that the Army and Air Force Reserve technicians were changed from the competitive to the excepted Civil Service and the technicians be excluded from the provisions of Executive Order 11491 which covered bargaining with federal labor organizations. It is interesting to note that Gen. Gerard came up through the ranks of New Jersey's Air National Guard and is presently chief of staff to the Governor of New Jersey.

Obviously, the track record of the National Guard Bureau and various states adjutants generals is one of anti-federal employee union. They want total, autocratic, control of their employees. They do not believe that any civilian employee under their direction should have the right to have an unbiased third party investigate and rule on any complaints the individual may have. If we analyze the history of the full-time military support conversions, we should see the anti-union trend develop. The NCR report should have removed the supposed union interference issue when it concluded:

> "Although various issues related to technician union activities were cited by the Defense Manpower Commission and the House Appropriations Committee, there was little information presented in the test reports on the subject. No specific examples of union interference with military activities or unit readiness were cited by any of the components."

What problems do we face with a "mix" of civilian employees and AGR military personnel in the full-time support program?

- Two complete sets of rules and regulations are required (dual administration).
- Immediate 30-day leave policy for AGR personnel.
- Unlimited sick-care provisions. This would include travel and per diem to have dental work and examinations at military facilities many miles from their home station.
- Restoration rights for those civilian employees who convert to AGR and then back into the civilian program which has been denied veterans preference under law (PL 90-486).
- If the AGR program is discontinued the AGR personnel in the program who had converted from the technician program will now "bump back" into a technician slot and cause technician morale devastation. It should again be noted that the AGR personnel who converted from his technician position did so to make a "fast buck" from the government and gain many more active-duty points for his future military retirement.
- At a time when the administration is attempting to keep federal employees on the job longer and cut retirements, the AGR program does the opposite. An AGR can retire after 20 years of service.
- Many higher-graded civilian positions have been converted to AGR positions, thereby eliminating any upward mobility for the career civilian employee.
- Many AGR personnel are overgraded in military rank for the position they hold.
- Many AGR personnel are stockpiling leave and time off granted for required unit training assemblies.
- Civilian technicians and AGR personnel perform the same duties but the AGR is paid much more for performance of these same duties.
- Civilian technicians and AGR's both belong to a National Guard unit and would mobilize with that unit.
- All civilian salaries are taxed and they contribute to their retirement fund and pay for their own hospitalization. The AGR does not pay tax on quarters, subsistence and housing allowances.
- AGR personnel have daily use of local commissaries and receives government educational benefits.

Unfortunately, while many states adjutants general have reservations about the actual need and cost of the AGR program, it appears that they are not raising objections to the program with the National Guard Bureau or their elected representatives. Furthermore, failure by the AGs to achieve the prescribed number of conversions could lead to the elimination of some technician manning positions in their respective states.

Conclusion

To continue with the AGR program is unconscionable. It serves no meaningful purpose. The present administration is constantly cutting unwarranted programs and this is a program that should be abolished. We certainly believe that technician performance leads to more consideration of new manpower alternatives. Well over 30 years of performance, bruised only in the last three years by poor conceptual direction, should lead to studies to enhance the growing need for civilian technician manning.

We believe this subcommittee can provide impetus to important considerations in this area. The savings in funding would be high, and could be measured by gains in skills performance. Even today and for many years, Navy support ships are being manned by civilian merchant mariners. All active Air Force bases have many civil service employees supporting the active mission.

It is important to recognize that not only are additional tax dollars being unnecessarily expended on this AGR program, but a large portion of the military compensation received by AGR personnel is not subject to state income tax, whereas all of the civilian technician's pay is taxable. The program is a military luxury which, if continued, will only result in a great embarrassment to the defense establishment if it is brought to the public's attention.

Mr. Chairman, I respectfully request that no funding in this or any other appropriation shall be used to fund the conversion of any civilian technician position in support of the National Guard or Reserve by active-duty or reserve military personnel, or to continue to fund any existing active-duty position converted from civilian status beyond the incumbent's present tour of duty.

This concludes my formal statement. I shall be happy to respond to any questions you may have or provide any additional information you may desire.

Attachment 1

Bi-weekly comparisons (38 positions)

difference bi-weekly (AGR/technician)	$ 13,048.41
difference yearly (x 26 pay periods)	$339,258.66
average difference yearly (divided by 38)	$ 8,927.85

active positions, Army and Air Reserves and Guard	FY81	18,561
	FY82	21,508
	FY83	28,307

total, FY81 $8,927.85 x 18,561 = $165,709,823.80
total, FY82* $8,927.85 x 21,508 = $192,020,197.80
total, FY83* $8,927.85 x 28,307 = $252,720,649.90

*FY82 and FY83 military pay raises not included in figures.

position title	technician grade/step	technician net bi-weekly pay	AGR grd./serv.	AGR net bi-weekly pay	technician savings
training technician	GS 9/2	569.17	CPT03/11	1139.04	569.87
supply clerk	GS 5/1	415.58	Sgt.E5/12	796.67	381.09
military personnel clerk	GS 5/1	369.98	SFC 10	810.29	440.31
military personnel clerk	GS 5/2	386.76	SSgt.E6/2	546.22	159.46
unit administrator	GS 7/2	508.28	SFCE7/28	1053.58	545.30
unit administrator	GS 7/1	456.09	SSgt.E6/11	820.63	364.54
supply clerk	GS 5/1	364.94	SSgt.E6/22	873.81	508.87
military personnel clerk	GS 5/4	392.87	SSgt.E6/12	825.06	432.19
airframe mechanic	WG10/3	577.77	SSgt.E6/ 8	598.97	21.20
training technician	GS 9/1	551.76	1Lt.02/ 7	725.66	173.90
administrative officer	GS10/1	642.21	CPT03/18	1120.83	478.62
technical inspector	WG11/5	568.65	SFC E7/14	832.00	263.35
aircraft mechanic	WG10/2	535.82	E5/12	707.96	162.14
gen. sup. assistant	GS 7/10	620.11	CPT03/26	1148.63	528.52
aircraft mechanic	WG10	488.31	SP4 E4/4	502.20	13.89
unit administrator	GS 7/8	575.35	SFC E7/20	952.53	377.18
(not listed)	GS 7/5	514.77	CPT03/12	1138.51	623.74
(not listed)	GS 7/5	551.50	SFCE7/16	914.28	362.78
(not listed)	GS 6/5	465.23	SFCE7/10	869.10	403.87
(not listed)	GS 7/10	583.86	MSgt. E8/30	1116.05	532.19
aircraft mechanic	WG10	488.31	SrA E4/4	502.22	13.91
admin. spec. typing	GS 5/2	377.02	Sgt.E5/6	547.99	170.77
comm. opns. technician	GS 7/8	556.12	MSgt.E7/12	882.87	326.75
supply technician	GS 6/4	451.50	MSgt.E7/12	882.87	331.37
air opn. spec.	GS 5/1	365.42	TSgt.E6/6	619.55	254.13
mil. pers. com.	GS 5/1	365.42	SrA E4/2	462.99	97.57
(not listed)	GS13/11	898.78	Maj.04/14	1307.99	409.21
(not listed)	GS 7/4	500.63	SFC E7/12	869.10	368.47
(not listed)	GS 7/8	556.12	MSgt.E8/20	1007.68	451.56
elec. mech. leader	WG	600.37	MSgt.E8/28	1125.35	524.98
training technician	GS 7/2	458.10	SFC E7/20	719.59	261.49
fuel dist. mech.	WG 8	417.93	Sgt.E5/16	749.61	331.68
clerk typist	GS 6/4	451.80	SSgt.E6/6	763.93	312.13
clerk typist	GS 5/4	406.25	SSgt.E6/8	777.43	371.18
admin. avn. assistant	GS 5/3	401.40	SSgt.E6/10	799.37	397.97
power supply mech.	WG 8	446.90	SP5 E5/16	749.56	302.66
avn. admin. clerk	GS 6/2	417.32	SP5 E5/4	529.63	112.31
enl. mil. advisor	GS 8/10	642.07	CSM E9/30	1199.36	557.29

All pay received by a technician is taxable.

AGR receives free retirement, free health insurance, free education benefits and commissary privileges.

Cost differential: 13 examples

Here are 13 examples of current technician positions at a New York Air National Guard base and how the cost of each would change if there was a conversion to Active Guard Reserve (AGR).

job description	civil service level	salary	military pay grade	salary	difference
medical technician	GS 6	$14,328	E6	$23,333	$ 9,005
medical technician	GS 9	$19,477	E7	$29,332	$ 9,855
supply technician	GS 6	$14,328	E6	$23,333	$ 9,005
supply technician	GS 5	$12,854	E6	$23,333	$10,479
supply technician	GS 6	$14,328	E7	$29,332	$15,004
supply technician	GS 6	$14,328	E7	$29,332	$15,004
supply technician	GS 6	$14,328	E5	$17,754	$ 3,426
personnel technician	GS 6	$14,328	E6	$23,333	$ 9,005
radio operator	GS 7	$15,922	E6	$23,333	$ 7,411
supervisor, military personnel technicians	GS 9	$19,477	Capt. O-3	$34,810	$15,333
electrical mechanic	WG 11	$20,176	E4	$15,458	-$ 4,718
aircraft mechanic	WG 10	$19,448	E4	$15,458	-$ 3,990
clerk/typist	GS 6	$14,328	E4	$15,458	$ 1,130
		technician savings at these 13 positions . . .			$95,979

Air base, Georgia

job description	civil service level	monthly net pay	military pay grade	monthly net pay	monthly difference
flight-line mechanic	WG 10, step 1	$1,001.84	S/Sgt., 0-6 yrs.	$1,178.96	$ 177.12
flight-line mechanic	WG 10, step 1	$1,001.84	T/Sgt., 0-10 yrs.	$1,341.72	$ 339.88
corrosion control	WG 9, step 1	$ 950.45	E5, 0-4 yrs.	$1,137.35	$ 186.90
quality assurance inspector	GS 10, step 8	$1,377.70	E8, 18 yrs.	$1,770.91	$ 393.21
fuel cell specialist	WG 10, step 5	$1,058.52	E6, 10 yrs.	$1,342.60	$ 284.08
supply clerk*	GS 5, step 1	$ 695.83	T/Sgt., 0-6 yrs.	$1,286.09	$ 590.26
QC file clerk	GS 8, step 1	$ 964.47	S/Sgt., 0-4 yrs.	$1,012.94	$ 48.47
military pay clerk	GS 5, step 1	$ 715.61	T/Sgt., 0-14 yrs.	$1,373.85	$ 658.24

*four positions scheduled to be converted to AGR; 3 S/Sgt level, 1 T/Sgt level.

annual technician savings ... $48,032.64

Air base, Michigan

job description	civil service level	monthly net pay	military pay grade	monthly net pay	monthly difference
production control aircraft	GS 8, step 1	$1,006.42	E5, 8 yrs.	$1,286.36	$ 279.94
secretary/steno	GS 5, step 1	$ 725.60	E7, 12 yrs.	$1,610.30	$ 890.70
clerk/typist	GS 5, step 1	$ 744.14	E4, 2 yrs.	$ 929.45	$ 185.31
intelligence operations specialist	GS 11, step 1	$1,354.93	O-4, 14 yrs.	$2,704.70	$1349.77
supervisor, electrical technicians	GS 11, step 1	$1,354.93	O-5, 34 yrs.	$3,344.06	$1989.13
material control technician	GS 7, step 1	$ 905.84	E6, 10 yrs.	$1,421.01	$ 515.17
fabric worker	WG 9, step 1	$1,106.89	E6, 10 yrs.	$1,421.01	$ 314.12
aircraft refuel vehicle operations	WG 8, step 1	$1,065.34	E5, 8 yrs.	$1,286.36	$ 221.02
quality inspection special aircraft	GS 8, step 1	$1,006.42	E6, 10 yrs.	$1,421.01	$ 414.59
supply clerk	GS 5, step 1	$ 744.14	E5, 8 yrs.	$1,286.36	$ 542.22
aircraft electrician	WG 10, step 1	$1,168.20	E5, 8 yrs.	$1,166.75	-$ 1.45
aircraft electrician	WG 10, step 1	$1,149.66	E6, 16 yrs.	$1,528.44	$ 378.78
aircraft mechanic	WG 10, step 1	$1,168.20	E5, 8 yrs.	$1,286.36	$ 118.16
sheet metal mechanic	WG 10, step 1	$1,168.20	E5, 8 yrs.	$1,286.36	$ 118.16
welder	WG 10, step 1	$1,168.20	E5, 8 yrs.	$1,286.36	$ 118.16
aircraft engine mechanic	WG 10, step 1	$1,149.66	E5, 8 yrs.	$1,286.36	$ 136.70
aircraft orderly systems mechanic	WG 10, step 1	$1,168.20	E4, 2 yrs.	$ 929.45	-$ 238.75
			annual technician savings . . .		$95,700.91

Attachment 2

THE ROLE OF MILITARY FORCES

Table 1. Military Call-Ups in Labor Disputes, January 1970 – August 1981.

Dates	*Place*	*Government Employees on Strike*
1970: Mar. 24-30	New York City	Postal Workers
1971: June 25	Nashua, New Hampshire	Firefighters
1973: Jan. 3	Milwaukee, Wisconsin	City Employees
1973: July 6-12	Puerto Rico	Firefighters
1973: Sept. 1-3	Texas	Traffic Safety
1973: Sept. 12-13	Texas	Prison Guards
1973: Nov. 5-10	Milwaukee, Wisconsin	Firefighters
1974: Mar. 12-13	Warm Springs, Montana	Mental Health
1974: Mar. 18-21	Galen-Boulder, Montana	Hospital Workers
1974: July 12-18	Lucasville, Ohio	Prison Guards
1974: July 16-17	Cranston, Rhode Island	Prison Guards
1974: July 18-19	Lima, Ohio	Mental Health
1974: Nov. 10-12	Cranston, Rhode Island	Mental Health
1974: Nov. 27	San Juan, Puerto Rico	Water Works Employees
1975: May 13	Lucasville, Ohio	Prison Guards
1975: Aug. 13-Sept. 8	Pine Bluff, Arkansas	Firefighters
1975: Oct. 3-9	Kansas City, Missouri	Firefighters
1976: Nov. 11-16	Warm Springs, Montana	Mental Health
1976: Nov. 12-19	Springfield, Illinois	Public Employees
1977: July 3-22	State, Wisconsin	Prison Guards
1977: Sept. 2-12	St. Croix, Virgin Islands	Prison Guards
1978: Mar. 12-13	Rhode Island	State Employees
1978: July 1	Memphis, Tennessee	Firefighters
1978: July 14	Louisville, Kentucky	Firefighters
1978: Aug. 17	Memphis, Tennessee	Police
1978: Sept. 6	Mach, New Hampshire	Firefighters
1978: Sept. 14	Wichita, Kansas	Firefighters
1978: Nov. 18-23	St. Bernard Parish, Louisiana	Firefighters
1978: Dec. 1-6	Huntsville, Alabama	Police & Firefighters
1979: Feb. 5-Mar. 14	Montana	State Employees
1979: Feb. 1-10, and Feb. 16-Mar. 6	New Orleans, Louisiana	Police
1979: Apr. 18-May 7	New York	State Employees
1979: June 27-29	Cape Girardeau, Missouri	Firefighters
1979: May 2-4	Birmingham, Alabama	Police & Firefighters
1979: Sept. 12-20	Cranston, Rhode Island	Mental Health
1979: Oct. 21-Nov. 16	Hawaii	State Employees
1979-80: Dec. 27-Jan. 3	Kansas City, Missouri	Firefighters
1980: Mar. 18-23	Kansas City, Missouri	Firefighters
1980: May 8-16	Nashville, Tennessee	Firefighters
1980: July 14-25	Mobile, Alabama	Firefighters
1980: Nov. 24-26	Marion, Indiana	Firefighters
1980: Dec. 6-7	Boston, Massachusetts	Commuter Transit
1981: Mar. 1-2	Milwaukee, Wisconsin	Firefighters
1981: Mar. 20-21	Milwaukee, Wisconsin	Firefighters
1981: June 23-25	Concord-Manchester, New Hampshire	State Employees
1981: July 10-14	Boston, other locations, Massachusetts	Mental Health
1981: August	Nationwide	Air Traffic Controllers

Source: National Guard Bureau, Washington, D.C.

DECEMBER 28, 1981 Army Times

Active Guard Reserve — 'A Kick in the Shins'

Sgt. Maj. FELIX L. HELMS

TUPELO, Miss. — As an Army adviser to the National Guard I have been queried about an inequitable program that is adversely affecting the morale of the Reserve Components. Once publicized, this plan will undoubtedly raise the ire of Congress and put a few holes in the active Army's esprit balloon.

The program is titled the "Active Guard Reserve." Under the plan, Army National Guard and Army Reserve civil service employees are converted to active duty status, generally at the rank they hold in the Guard or Reserve. Upon conversion, these AGR personnel receive the same pay, benefits and retirement as Regular Army personnel. In reality their benefit package is better than that of their Regular Army counterparts.

They are not eligible for worldwide assignment, make no PCS moves, do not have to compete in DA centralized promotion system, upon conversion receive a $5000-to-$15,000-a-year raise, depending upon grade, and with normal 20-year retirement, plus two options on previously acquired civil service retirement benefits, could net a lump-sum cash payment of $20,000 to $70,000.

This program is another kick in the shins to the Regular Army soldier who has spent his career continuously moving his family from one location to another, enduring the associated and financial difficulties of PCS moves — not to mention the unaccompanied tours.

Many full-time National Guard technicians are very disgruntled with this program. The AGR plan is described by many employees as extremely inequitable. Each state has handled the program as it saw fit. One state military department centrally controls the selection of the personnel to be converted, while another delegates the authority for selection down to the major command level. The inconsistencies in personnel management are self-evident.

In Alabama the conversion authority was delegated to the brigade/group level. In one such organization, the senior civil service employee, the command administrative assistant, made the decision that no one in his command would be allowed to convert. Conversely, another CAA made the program available to all his full-time personnel, thus providing freedom of choice.

In Mississippi, all conversions were administered by the military department. This system appears fraught with inconsistency and "perceived favoritism." This is highlighted by the following example, which is not a lone case.

Two GS7 civil service employees working in the same office, one having a Guard rank of W-4, and the other E-8, were allowed to convert. The W-4 was allowed to convert as a W-4, but the E-8 had to take a one-grade reduction before he could convert. Both jobs are equal in workload and responsibility and as civil service employees, both received approximately the same pay, the difference being in step level. Now that they have converted to AGR the W-4 is making $11,000 a year more than the E-7. The GS7, now a W-4, received an across-the-board pay increase of about $15,000 a year and the GS7, now an E-7, had a pay increase of about $5000. In other instances E-8s with several years in grade and civil service time on the job were not given an opportunity to convert as E-8s, but recently promoted E-8s with very little civil service time on the job were converted as E-8s.

The real morale problem is at the civil service supervisory level. Civil service supervisors in grades GS10 through GS12 holding field grade commissions of O-4 through O-6 now are making up to $10,000 a year less across the board than employees that are one to four levels below them. One wonders how it would be received in the regular force if E-7s suddenly made more money than their O-6s.

Considering the Reagan administration's desire to cut unnecessary government spending, it is difficult to understand why our leadership in the Congress and in the Department of Defense sanctioned this inequitable and inflationary program. Apparently the money it is going to cost the taxpayers was not considered. Nor did they take into account the far-reaching adverse effects it could have on the Reserve and active components.

What is going to happen to the state militia? Will Congress pass new legislation that will allow governors to call out and use federal troops in disasters and civil disturbances? Will a National Guard unit have to operate without its key AGR personnel if called out for a state disaster or civil disturbance, because they are technically federal troops? These questions need to be answered.

As a dedicated unit Army adviser living with the National Guard, day in day out, I can attest that the vast majority of the units I have contact with are composed of dedicated professionals. These part-time soldiers are loyal Americans who are prepared and willing to come to the aid of their country and state. The implementation of the AGR program seems to show that we have lost sight of the goal of training and equipping the total force for combat while maintaining the integrity of the state militia.

If the AGR program is here to stay, standardize it and make it equitable to all. One solution might be to require all personnel entering the AGR program to contract for six years. Three of the six years, the individual would be stabilized at the point of entry. The remaining three years, the individual would be eligible for worldwide assignment in his primary MOS. Upon expiration of the six-year contract the individual would have the option of terminating or integrating into the Regular Army, if qualified. Additionally, if all AGR personnel were managed by MilPerCen, then the promotion criteria would become standardized throughout the force.

The AGR system and all of its shortcomings and unfairness are real. Until our leaders realize this, it will continue to fester to the detriment of the total force concept.

DISPARITY IN PAY INCREASES

Senator **Stevens**. Gentlemen, you have made your point. We will take a look at it. I think it is going on and I have seen it in Alaska. I don't understand it, except that it seems directly related to the disparity in pay increases for the military as compared to the civilian sector. That is what is happening as far as I can see.

I am not sure it is all involuntary. I think some people are seeking to shift over. I don't blame them, if they are going to get a substantial increase in pay as compared to staying in the civilian jobs, and why not go AGR.

So I don't think that it is something that is any great conspiracy on the part of the uniform personnel. I think the civilians who are in technician spots would like to convert over and pick up the 15- and 11-percent increase as compared to the 0 or 4 or 11 or 9.5. In the past 5 years the military has had substantial increases as compared to civilians.

Mr. **Hunter**. Well, I can see that if there was an advantage to going into the AGR program, but there is not advantage whatsoever because Public Law 90–486 mandates that every civilian employee within the National Guard has to hold a compatible military position and has to be ready for mobilization. There is absolutely no gain by going into this program, except that the taxpayers are footing the bill. This is it.

Senator **Stevens**. Well, there is a gain to the individual. They are getting paid one hell of a lot more money.

Mr. **Hunter**. The individuals. I am talking about the gain as far as the Guard Bureau or the agency, DOD.

Senator **Stevens**. I understand that. We will look into it and I think it is a problem that we all have to be aware of and address.

Mr. **Hunter**. Thank you, sir.

Senator **Stevens**. We do thank you for your testimony. Thank you very much.

National Federation of Federal Employees

STATEMENT OF JAMES M. PEIRCE, PRESIDENT, NATIONAL FEDERATION OF FEDERAL EMPLOYEES

DEFENSE BUDGET CONTRACTING

Senator **Stevens**. Mr. Peirce.

Mr. PEIRCE. Good morning.

Senator STEVENS. Good morning.

Mr. PEIRCE. Mr. Chairman, we would like to have our statement placed in the record and I will summarize, shortly, a few points.

Senator STEVENS. Yes, sir.

Mr. PEIRCE. We appreciate the opportunity to appear to discuss the fiscal year 1983 defense appropriation. Without question, NFFE's greatest concern with the defense budget is its increasing reliance on contracting out.

In fiscal years 1982 and 1983 the administration has targeted no less than 35,000 civilian positions for elimination and the funding transferred to contract use. This would be a tragedy not only for the workers occupying these positions but also for the average American taxpayer.

While NFFE has objected strenuously to the contracting out policies of previous administrations, our objections focused mainly on cost comparison techniques and restrictive personnel ceilings. Past administrations at least claimed that cost effectiveness was at the heart of their programs.

It was and is our aim to ensure that in-house versus contract costs are measured and compared accurately and that enough employees are onboard to perform the work that in the vast majority of cases can be better and less expensively accomplished than in private industry.

With the current administration, however, all pretense regarding cost effectiveness has been discarded. The administration simply wants to turn as much of the Federal Government's work as possible over to profitmaking companies, regardless of the expense to the American people.

As evidence, I call your attention to a draft revision of OMB circular A-76, the policy-setting instrument for contracting out Federal Government operations and services, presumably developed by officials of the administration. While the draft is yet to be distributed for public comment, NFFE obtained a copy and studied it thoroughly. It is a shocking document reflecting a complete and utter disregard for the public trust, Government efficiency, and the rights of Federal workers.

The draft would indeed revise the Government's policies on contracting out. Requirements for cost efficiency, which must out of concern for the taxpayer be the most important factor in decisions to contract out, would be virtually eliminated from the process.

The draft is an open invitation to private contractors to compete only among themselves for the chance to rip-off the Federal Government to the tune of billions of dollars. It comes at the very moment the administration, through its misguided economic program, is forcing millions of citizens to endure hardships unprecedented since the Great Depression.

CHANGES TO CONTRACTING OUT POLICY

The draft revision would make many changes to current contracting out policy. Certainly the most significant and the most onerous is the new threshold it proposes for mandating comparisons between in-house and contractor cost for operating commercial and industrial activities.

The proposed threshold contained in the draft revision is beautiful in its simplicity yet potentially devastating in its budgetary impact. Rather than utilizing a certain cost as the cutoff point below which cost comparisons need not be conducted, the draft proposes to use the size of an activity's workload. Virtually any eligible activity with fewer than 25 employees would be contracted out by September 30, 1983, without a cost study.

The proposed threshold could not have been more favorable to private contractors and less considerate of the taxpayer if it had been drafted by the contractors themselves. Indeed, we suspect this may be the case.

Another insidious provision of the revised A-76 is the stipulation that all "new requirements" and those "newly established needs for a government product or service" be contracted out without a cost comparison. In other words, the draft A-76 would give every new Government commercial and industrial activity to private contractors regardless of cost.

Once again, it is difficult to conceive of a proposal more favorable to business and at the same time more insensitive to the interests of the average American.

Mr. Chairman, this policy change is the most blatant attempt yet to channel Federal revenues to private industry at the expense of the taxpayer, and it represents a dangerous move to install a spoils system that will cost the taxpayers billions of dollars. Fortunately many in Congress are finally awakening to the realization that contracting out is most often an expensive and inefficient proposition in comparison with in-house performance.

The House Armed Services Committee in fact has included language in their fiscal 1983 defense authorization bill which would place a 1-year moratorium on contracting out within DOD. The purpose of the moratorium, according to the committee report, House Report 97-482, is to provide time to develop permanent legislation establishing policy guidelines that will reorient the program in a sensible manner.

NFFE urges the members of the subcommittee to support the moratorium. It is critical that Congress take immediate steps to at least delay the White House head-long rush to make wholesale transfers of Government functions to private industry. Perhaps a 12-month cooling-off period would give legislators a chance to assess the potential budgetary and programmatic damage of the program.

Moreover, it would provide the opportunity to develop an alternative policy with greater emphasis on the prudent use of tax dollars rather than the amount of profits private business can drain from the U.S. Treasury. At this time, I would like to discuss another issue of great importance.

As I am sure you are aware, there has been a problem for quite some time with the National Guard Bureau concerning the civilian versus the military status of technicians. The problem has reached the point where technicians feel it is intolerable. Some form of action is necessary, and we ask the subcommittee's assistance.

Civilian technicians work during the normal 40-hour week as civilians and much as other employees within the Department of Defense. However, they must also belong to the National Guard in order to retain their civilian positions. This dual status causes several problems, one of them being housing.

DOD personnel must occupy Government quarters when traveling on temporary duty assignments. Civilian employees of DOD are housed according to their civilian grade, and the higher the grade the better the quarters. The military are housed based upon their military rank. Although the technicians are in a civilian status, more often than not while on TDY they are nevertheless housed according to their military rank.

Since most technicians occupy civilian positions in a much higher grade than their military rank, this policy places them in less adequate quarters. To complicate matters, the housing for enlisted personnel is often far below the standards required by agency regulations.

We therefore ask the committee to instruct the National Guard Bureau and the services to institute a policy which requires technicians to occupy quarters when on TDY based upon their civilian grades when in a civilian status and their military ranks when in a military status. Without these changes, technicians will no longer volunteer for TDY and defense readiness will be adversely affected.

NFFE is also deeply concerned with the large number of technician positions converted from civilian to military status and the additional conversions plan for fiscal year 1983. We urge an end to this misguided program as soon as possible but no later than September 30, 1982, the end of the fiscal year.

The civilian technician force has been the backbone of the National Guard for many years. Their experience is a major asset to the armed services and to the military mission of our country. Yet many technicians are leaving the Guard for employment in private industry expressly because of the conversion issue. Their positions are being filled at a significant increase in cost by new and less experienced personnel who simply cannot match the quality workmanship of their predecessors.

I might add, Mr. Chairman, that I believe it was during the last session or the last Congress, while the test program was going on, that we submitted factual evidence indicating that full-time military positions were significantly more costly.

Relative to your earlier comment, there is no doubt in my mind, having been across this country and in National Guard units, that the National Guard employee as a technician can make a significant gain by going to AGR. This is what is happening to a number of them. For the most part they feel they are being forced to that end, sort of as a bribe. I think this doesn't serve the National Guard or the taxpayer.

The subcommittee can stem the loss of civilian technicians together with their knowledge and skills by putting an end to the conversion program. Once more we urge you to do so.

Thank you, Mr. Chairman.

This concludes our statement.

[The prepared statement of Mr. Peirce follows:]

PREPARED STATEMENT OF JAMES M. PEIRCE
PRESIDENT
NATIONAL FEDERATION OF FEDERAL EMPLOYEES

Mr. Chairman and Subcommittee Members: The National Federation of Federal Employees is pleased to appear today to discuss fiscal 1983 defense appropriations. Nearly half of our organization's members are defense department employees.

The Reagan Administration's increasing reliance on private contractors to perform Government functions is a source of great concern to NFFE. In DoD alone, the Administration has targeted over 35,000 civilian positions for elimination in fiscal years 1982 and 1983 and the funding transferred to contract use. This would be a tragedy not only for the workers occupying these positions but also for the American taxpayer.

The controversy over the size and cost of the Federal bureaucracy centers on its direct-hire employees. Yet, as many people both in and out of Congress are finally beginning to realize this concern is misdirected; there is now an empire of Federal contractors that dwarfs the bureaucracy, an empire that is being continually strengthened and enlarged by policies which place unnecessary restrictions on the size of the Federal workforce and blatantly favor private industry over the public sector.

The statistics are frightening. According to a June 19, 1981 report by the General Accounting Office, between 1970 and 1980 "the size of the civilian executive branch workforce has decreased by about 120,000 employees (from 2.94 million to 2.82 million), as total Federal expenditures have increased about 195 percent. Concurrently, Federal expenditures for service contracts, adjusted for inflation, increased 28 percent." It is important to note that in the same report the GAO said, "In our opinion, the rapid growth in service contract expenditures partly reflects agencies' reaction to personnel ceilings and the increased demands of new or expanded Government programs."

Still more frightening is that no one really knows the true extent of the Government's contracting-out activities. Though there have been many attempts to force a precise accounting, one has never been produced. Perhaps someday reliable data will be available. At the present time, however, accurate statistics on contracting out are virtually nonexistent and, if pressed, the Executive Branch could not explain to the American people exactly where one tax dollar out of every four eventually goes.

Despite the lack of control over contract costs the Reagan Administration is pressing forward with its program to contract out just about every Government function possible. We call your attention to a draft revision of OMB Circular A-76, the policy-setting instrument for contracting out Federal Government operations and services, presumably developed by officials of the Administration. While the draft has yet to be distributed for public comment, NFFE obtained a copy and studied it thoroughly. It is a shocking document, reflecting a complete and utter disregard for the public trust, Government efficiency, and the rights of Federal workers. The draft would indeed revise the Government's policies on contracting out. The requirements for cost efficiency, which must, out of concern for the American taxpayer, be the most important factor in decisions to contract out, would be virtually eliminated from the process. The draft is an open invitation to private contractors to compete only among themselves for the chance to rip-off the Federal Government to the tune of billions of dollars. And it comes at the very moment the Reagan Administration, through its misguided economic program, is forcing millions of citizens to endure hardships unprecedented since the Great Depression.

The draft revision would make many changes to current contracting out policy. Certainly the most significant, and the most onerous, is the new threshold it proposes for mandating comparisons between in-house and contractor costs for operating commercial and industrial activities.

The proposed threshold contained in the draft revision is beautiful in its simplicity yet potentially devastating in its budgetary impact. Rather than utilizing a certain cost as the cut-off point below which cost comparisons need not be conducted, the draft proposes to use the size of an activity's workforce: "Activities with less than 10 FTEs (full-time equivalent employees) shall be converted to contract performance as soon as practicable," the draft states, "but no later than September 30, 1983, without a cost comparison. Agencies should not incur the delay and expense of conducting cost comparisons to justify in-house performance of commercial activities with 10 to 25 FTEs. Such in-house activities should be converted to contract as soon as practicable, but no later than September 30, 1983, without a cost comparison."

The proposed threshold could not have been more favorable to private contractors, and less considerate of the taxpayers, if it had been drafted by the contractors themselves. Indeed, we suspect this may be the case. The size of an activity's workforce bears little, if any, relationship, to the size of its annual budget: 25 employees could manage activities with yearly budgets ranging from $400,000 to $4 million or perhaps $400 million. But according to the new standard these activities, with few exceptions, would be contracted out -- period -- regardless of whether Federal workers can perform the work better and at less cost.

Activities with more than 25 FTEs would undergo a cost comparison unless, in the view of the agency head or deputy, "the results of recent cost comparisons of like activities, GAO report audit findings, etc., the in-house operation does not have a reasonable expectation of winning the competition...."

We doubt more vague or nebulous wording has been proposed for a Federal regulation. This language, coupled with the 25-employee threshold, is an open invitation to Administration political appointees to arbitrarily turn $20 - $30 billion in commercial and industrial activities over to private contractors and the poor quality, "buy-in" bids, and cost overruns that have become commonplace in contract performance.

Another insidious provision of the revised A-76 is the stipulation that all "new requirements," those "newly-established need(s) for a Government product or service," be contracted out without a cost comparison. In other words, the draft A-76 would give every new Government commercial and industrial activity to private contractors regardless of cost. Once again, it is difficult to conceive of a proposal more favorable to business and, at the same time, more insensitive to the interests of the average American citizen.

The revisions to A-76 contain many objectionable proposals in addition to those already cited. They would, for instance, reduce protections for employees whose jobs have been lost to contract, as well as restrict the appeals process. The current provisions are so weak the changes would be barely noticeable. The point is, however, that at the same time the Administration proposes to accelerate contracting out it would weaken the safeguards for the very employees who would be most harmed.

As noted previously, many in Congress are finally awakening to the realization that contracting out is often an expensive and inefficient proposition in comparison with in-house performance. The House Armed Services Committee, in fact, has included language in the fiscal 1983 defense authorization bill which would place a one-year moratorium on contracting out within DoD. The purpose of the moratorium, according to the Committee report (House Report (97-482), is to provide time to develop "permanent legislation establishing appropriate policy guidelines that will re-orient the program in a sensible manner."

NFFE urges the members of the Subcommittee to support the moratorium. It is critical that Congress takes immediate steps to at least delay the White House's headlong rush to make wholesale transfers of Government functions to private industry.

Perhaps a 12-month cooling off period would give legislators a chance to assess the potential budgetary and programmatic damage of the Reagan program. Moreover, it would provide the opportunity to develop an alternative policy placing much greater emphasis on the prudent use of tax dollars rather than the amount of profits private business can drain from the U.S. Treasury.

* * *

As I am sure you are aware, there has been a problem for quite some time within the National Guard Bureau concerning the civilian versus military status of technicians. The problem has reached the point where technicians feel it is intolerable. Some form of action is necessary, and we ask the Subcommittee's assistance.

Civilian technicians work during the normal 40-hour week as civilians, much as other employees within the Department of Defense. However, they must also belong to the National Guard in order to retain their civilian positions. This dual status causes several problems, one of them being housing.

DoD personnel must occupy Government quarters when traveling on temporary duty assignments (TDY). Civilian employees of DoD are housed according to their civilian grade; the higher the grade, the better the quarters. The military are housed based upon their military rank. Although the technicians are in a civilian status more often than not while on TDY, they are nevertheless housed according to their military rank. Since most technicians occupy civilian positions at a much higher grade than their military rank, this policy places them in less adequate quarters. To complicate matters, the housing for enlisted personnel is often far below the standards required by agency regulation.

On May 21, 1981 the Chairman of the House Defense Appropriations Subcommittee addressed a letter to Casper Weinberger, Secretary of Defense, listing several requirements which Army Reserve and National Guard technicians must follow. One of these was, "Military technicians will occupy government quarters based on military grade when in a travel status." Since that date the NGB has revised its regulations to redefine all dual status technicians as "military technicians." In addition, they have just proposed a change to their regulations which would mandate that technicians occupy quarters based on military rank.

In a recent TDY trip to Eglin Air Force Base, members of NFFE Local 1669, from Fort Smith, Arkansas, were housed in substandard quarters, contrary to Air National Guard regulations and Air Force regulations, as well as to their negotiated agreement. The technicians' Commander knew the quarters were inadequate, but Eglin's billoting officer would not give a substandard release so they could occupy other quarters. Approximately 50 people were housed in a facility that could accommodate barely half that many. Aside from the shabby, crowded conditions there were safety hazards throughout the entire building. In addition, there was one bus, a 28-seater, to carry more than 50 individuals to and from work. There was no transportation at lunch, yet they were denied access to the mess hall. They finally had to rent vehicles to travel around.

Unfortunately, this is not a unique situation. We therefore ask the subcommittee to instruct the National Guard Bureau and the services to institute a policy which requires technicians to occupy quarters when on TDY based on their civilian grades when in civilian status, and their military ranks when in a military status. Without these changes, technicians will no longer volunteer for TDY and defense readiness will be adversely affected.

NFFE is also deeply concerned with the large number of technician positions converted from civilian to military status and the additional conversions planned for FY'83. We urge you to end this misguided program as soon as possible but no later than September 30, 1982, the end of the fiscal year.

The civilian technician force has been the backbone of the National Guard for many years. Their experience is a major asset to the armed services and to the military mission of our country. Yet, many technicians are leaving the Guard for employment in private industry expressly because of the conversion issue. Their positions are being filled by new, less experienced personnel who simply cannot match the quality workmanship of their predecessors. The vital functions which technicians perform suffer accordingly.

The Subcommittee can stem the loss of civilian technicians, together with their knowledge and skills, by putting an end to the conversion program. Once more, we urge you to do so.

That concludes my statement. I will be happy to answer any questions.

SAVINGS IN SWITCH TO AGR

Senator STEVENS. That is a real complex thing, you know. They switch to AGR and they don't have to contribute to their own retirement. They get the pay increase that has been accorded twice to the military and it was not given to the civilians. That is the one hand. On the other hand, if the Government contracts out, it doesn't have to pay the retirement, it doesn't have to pay the housing, it doesn't have to pay the post exchange and it doesn't have to pay the medical that is paid if it is kept in AGR.

So it is an interesting maze that we have to deal with. Frankly, I can understand why some people are looking to contract out rather than convert to AGR. That is what is starting now. From the point of view of dollar signs, the dollar signs are bigger to go AGR than they are to go contracting out.

I think we need to have some real comparison of it. I hope to get this committee into that next year, but we can't get into it this year.

Mr. PEIRCE. We would appreciate that. I would like to make two points.

One, the data that we collected under the test program was prior to the last increase in military pay, which was a significant one.

Second, on my meeting with base commanders, installation commanders, and so forth since January of this year, most of the base commanders that I talked to, I would say about 95 percent, are very concerned about contracting out. They are beginning to feel that they cannot effectively accomplish their missions if this contracting out continues. The total push seems to be coming from top side, and, as I say, virtually all of those in the field don't feel this is an appropriate way to go.

Senator STEVENS. Thank you very much. I appreciate your testimony.

Thank you.

Mr. PEIRCE. Thank you, Mr. Chairman.

U.S. COUNCIL FOR AN OPEN WORLD ECONOMY

STATEMENT OF DAVID J. STEINBERG, PRESIDENT, U.S. COUNCIL FOR AN OPEN WORLD ECONOMY

BUY AMERICAN STRICTURES

Senator STEVENS. Mr. Steinberg.

Mr. STEINBERG. Good morning, Mr. Chairman.

I am David J. Steinberg, president, U.S. Council for an Open World Economy. The council is a public interest, private nonprofit organization engaged in research and public education on the merits and the problems of developing an open international economic system. As in my previous appearances before your subcommittee, my testimony deals entirely with the buy American strictures that affect defense procurement.

It is my view that these buy American requirements are a policy hodge-podge that urgently require reassessment and reform to make sure that they contribute, if they are to be continued at all, to a cost-efficient, constructive, coherent Government effort to improve the mobilization base and help the affected U.S. industries make a successful adjustment to the problems that may now be besetting them.

As your subcommittee is aware, I am sure, there are what might be called macro buy American requirements and micro buy American requirements.

The macro requirements consist of the Buy American Act, supplemented by the 1962 Executive order that gives 50-percent advantage to American suppliers in defense contracting, for balance-of-payments reasons.

TEXTILES AND SPECIALTY METALS

The micro buy American rules consist of specific-industry strictures that affect textiles, specialty metals, and certain other industries. The best known are those on textiles and specialty metals.

There are various exemptions from these requirements by U.S. commitments under multilateral trade agreements. There are waivers from these requirements with respect to certain products in the specialty metals field and in textiles for the purpose of NATO standardization and interoperability and for other purposes.

Now, it is our view, Mr. Chairman, that these buy American rules, which I have referred to as a policy hodge-podge, do not add up to a coherent effort by Congress to use buy American requirements in the most efficient manner to the extent that these requirements are justified by the public interest.

We therefore urge the subcommittee, and we urge the Congress, to ask the President in preparation for fiscal 1984, to report to the Congress on what role these buy American requirements serve, how they contribute and how effectively they may contribute to helping solve the problems of ailing industries, what these buy American strictures cost the American taxpayers and what steps ought to be taken and can be taken to phase out these buy American requirements as quickly as possible.

Senator STEVENS. I have to tell you your recommendations are made to the wrong committee. We would have no authority to go into that kind of review. We might have authority to look to a special circumstance. I see that you disagree very violently with what the committee did last year in terms of the specialty metals.

Mr. STEINBERG. Yes, sir.

Senator STEVENS. That was a temporary concept and on a year-by-year basis that is within the jurisdiction of this committee. The recommendations you are making are not within the jurisdiction of this committee and I would advise you to present your testimony to the Armed Services Committee which does have the jurisdiction over the general concept of buy American as it affects the Defense Department or to the other committees of Congress that deal with the general buy American concepts.

Mr. STEINBERG. You know, it is awfully hard, Mr. Chairman, for a private citizen with very limited financial resources and very limited staff resources to think clearly of where one should make a presentation to a congressional committee because, as you know, and as I am sure Senator Rudman knows, there are all kinds of overlapping jurisdictions here.

I have, with due respect, sir, in previous years presented such testimony before your subcommittee. If it is within the subcommittee's judgment that this indeed is the wrong committee and that you can absolutely do nothing about it, if you would please tell me where I can go, I would certainly make the effort to present these views elsewhere in the Congress.

Now you did mention the Armed Services Committee. Last year, in addition to asking for an opportunity to testify before your subcommittee, I asked for a chance to testify before the Armed Services Committee and I got, I think, a form letter saying we will let you know and they never let me know.

So I am a little guy confronted with this huge——

Senator STEVENS. Well, you may be a little guy, but you represent the U.S. Council for an Open World Economy. Is that you? Is that council you or is it a U.S. council?

Mr. STEINBERG. I am the president of the council and we have a board of directors and it is very small, struggling organization, sir.

But, with all due respect, sir, if you think that this is not the place to make such a recommendation, then I am sorry I have taken your time.

I am not asking your subcommittee, sir, to make a study of the buy American issue. I am asking your committee to ask the President and the Secretary of Defense to make a study of the buy American issue and to report to the Congress.

Now, I am no purist on this. I am a devout free trader, but I can accept buy-American requirements. My trouble with the current pattern of buy-American requirements is that it is a policy hodgepodge, we don't know what it costs the country and yet some of these things go on and on. The textile thing has been on the statute books now for over 25 years. The 1962 Executive order for balance-of-payments reasons has been in the law of the country for the past 20 years and no one is reassessing these things.

Senator STEVENS. I have to tell you that you are talking to the wrong man. If I had my way we would put a provision in the law that said you couldn't spend Federal dollars on any imported products, period. So you are just dealing with the wrong person in talking to me about buy American. I would suggest you go to the Authorization Committee and see if they want to change the basic buy American requirements. We try to live with them and we, as you have indicated, extended them last year.

I mean you are wasting your time and mine, too, telling me that the whole history of my life in terms of buy American is wrong. I suggest you go to someone who might have the jurisdiction to change the basic law. We don't.

Mr. STEINBERG. Well, it is very disconcerting to find oneself caught up in the intricacies of committee jurisdictions, but so be it, these are the facts of life.

Senator STEVENS. Thank you very much.

Mr. STEINBERG. Thank you, Mr. Chairman.

[The prepared statement of Mr. Steinberg follows:]

PREPARED STATEMENT OF DAVID J. STEINBERG
PRESIDENT

U.S. COUNCIL FOR AN OPEN WORLD ECONOMY

(The U.S. Council for an Open World Economy is a private, non-profit organization engaged in research and public education on the merits and problems of developing an open international economic system in the overall public interest, the Council's only standard.)

Congress and the Executive Branch for too long have neglected the need to reform the disjointed, politically permeated array of Buy American requirements affecting defense procurement. Combatting inflation, making the most effective use of scarce financial resources, and finding real solutions to the real problems of ailing industries are among the aims of such policy overhaul.

These procurement strictures consist of (1) the Buy American Act (affecting government procurement across the board), supplemented by a 1962 executive order giving a 50 percent advantage, for balance-of-payments purposes, to domestic suppliers in defense procurement, and (2) an assortment of more-restrictive rules, established by Congressional initiative, mandating procurement of certain products from domestic industries alone (except for extraordinary circumstances). The best known of the specific-industry mandates involve textiles (since 1956) and products containing specialty metals (since 1972), including stainless steel (and stainless steel flatware per se).

Some products have been exempted from the general Buy American stricture by a multilateral trade agreement negotiated in the late 1970's, others by Congressional waivers in the interest of NATO standardization and interoperability. In addition, the Department of Defense obtained Congressional authority to purchase certain textile products from foreign sources in the interest of these NATO objectives. Waivers for such purposes (and to help "offset" foreign purchases of military equipment from the United States) were also obtained in 1977 for certain products containing specialty metals, but these waivers were terminated in the defense appropriations act of 1981 by backdoor Congressional sleight of hand in which operatives for labor and management in the specialty-steel industry played a key role. The defense authorization bill for fiscal 1983, which recently passed the Senate, includes a provision restoring the waivers on specialty metals. We urge Congress to sustain restoration of these waivers in the rest of the appropriations process for 1983. But more than this is needed -- in the interest of a strong, durable specialty-metals industry, and of sensible utilization of Buy American regulations in defense procurement.

The "sacred cow" subsidies in the considerable number of products still covered by Buy American strictures in defense procurement should be carefully reassessed and reformed. Congress, at long last, must find more-enlightened ways to address the problems of industries it feels require and deserve government assistance. The Buy American rules are examples of the shortsighted shortcomings of Congressional and overall government performance in this respect. This year's effort to restore the specialty-metals waivers reveals worthy concern about a more cohesive, cooperative military alliance between the United States and friendly nations, but no evidence of reassessing and reforming government assistance to industries that need and merit such assistance.

Lack of Coherent Industrial Policy

Buy American strictures in defense procurement are a policy hodgepodge. They are not components of a coherent, well-designed policy of government aid to ailing industries. There is no periodic reassessment of these strictures in the interest of sound policy formation and the most efficient use of financial resources in this major sector of the government's budget. Nor is any Buy American requirement concerning the products of specified U.S. industries related in any way to coherent attention to the real problems and needs of the respective industries. For example, there is no coherent textile policy of this description, of which the Buy American requirement on textiles is a part; nor a coherent specialty-metals policy, of which the Buy American requirement on products containing specialty metals is a part. Nor does the government know what the Buy American strictures in defense procurement cost, their contribution to the strength of these industries, how long these measures may be needed, what alternative or supplementary measures may merit adoption, and why "micro," specific-product Buy American requirements are needed over and above the "macro" rules of overall Buy American standards.

Instead of coherent, cost-efficient strategies addressing the real problems of industries meriting government help, we have simplistic, costly concessions to political pressures for government protection against foreign competition -- and (with some exceptions) retention of these measures year-in and year-out, no matter the need for an all-out effort to solve industrial problems, increase industrial productivity, reduce subsidies, combat inflation and use most efficiently and productively the funds provided by American taxpayers. The cost increasing, inflationary implications include the tendency for Buy American strictures to increase costs for U.S. manufacturers who (to the extent that these strictures do not deter them from using imported materials in the production of such items) are determined to bid on defense contracts for any of the affected products and may find it necessary to incur special inventory and other expenses where production for defense contracts must be kept separate from non-defense production.

To the extent that these industries are essential to national security, there is all the more reason to deal incisively with their real problems. Subsidizing such industries through the Buy American requirements now in effect is thus, not only bad economics and shabby politics, but badly conceived attention to the mobilization base. To the extent that these industries need government help, such assistance should take the form of redevelopment strategies designed so to strengthen these sectors of the mobilization base that these industries might become viable without barriers against foreign competition (assuming they are not in this condition now). To the extent that any of these industries cannot survive without import barriers of some kind, yet must be preserved for legitimate national-security purposes, the American people have a right to know how, and how effectively, these import restrictions are helping to cure whatever problems warrant such government aid, and at what cost to the taxpayer.

Easy recourse to import restrictions tends to divert attention from the tougher, more responsible task of carefully diagnosing the real problems and needs of industries that may need and merit government help. It is policy laziness we can no longer afford, involving costs (financial and otherwise) that get higher as years pass and as the need for policy perfection grows more urgent. The substantial increase in the defense budget, particularly at a time of massive budget deficits that must substantially be reduced, makes these reforms all the more necessary.

Plan Now for Fiscal '84

Except for restoration of the waivers on certain products containing specialty metals, I am not asking that the defense-related Buy American strictures be terminated this year. I am not unmindful of the political realities. Moreover, to remove them abruptly, without adequate preparation within the policy framework suggested above, would not be in the national interest. I do urge that this year, in preparation for fiscal 1984 defense appropriations, Congress ask the President to reassess the defense-related Buy American requirements and report to Congress on (a) the extent to which they are needed, (b) other steps being taken or that should be taken to strengthen these industries within the framework of a coherent adjustment strategy, and (c) the cost of such an assistance program, including the Buy American requirements per se, in financial and other terms.

Here is an important opportunity for the government to launch an "industrial policy" with national-security implications -- a policy that addresses the real problems of ailing industries, phases-out subsidies that may no longer be needed, reduces the cost of national defense, promotes freer world trade, and aims at the higher productivity so essential to America's international competitiveness. The Administration should undertake these reforms whether or not Congress requests them. No movement along these lines appears to be under way in the Department of Defense. Nor has the Office of Management and Budget included the specific-industry strictures in the review it is supposed to have been conducting of Buy American rules affecting defense procurement.

Twenty-three years ago, the government imposed quotas on imports of petroleum in the supposed interest of national security. It did so without a coherent petroleum policy. The national-security clause of the trade legislation, under which these controls were imposed, did not require (and still does not require) such policy coherence, with systematic review of the policy's progress. That ill-considered, ill-fated approach to such an important issue is an important part of the story of national neglect, indeed national negligence, in the energy field. Isn't that import policy debacle enough of a lesson on the deceptions and dangers of simplistically using import controls as a remedy for alleged industrial weaknesses? When will government ever learn?

THE AMERICAN LEGION

STATEMENT OF ALAN OLSZEWSKI, ASSISTANT DIRECTOR FOR THE NATIONAL LEGISLATIVE COMMISSION OF THE AMERICAN LEGION

Senator STEVENS. The American Legion.

Mr. OLSZEWSKI. Mr. Chairman, I have prepared a summary of our statement and of course request that the full statement be entered into the record.

Senator STEVENS. Yes, sir, we will print your statement in full in the record. I regret that we have a situation where you are allocated 10 minutes. I hope next year, if I am still chairman of this subcommittee, to be able to allocate some additional time to the American Legion and the VFW and some of the other organizations that have dealt in depth with some of the problems that we have to tangle with. We welcome your statement.

Mr. OLSZEWSKI. Thank you very much.

Thank you, Mr. Chairman, for providing the American Legion the opportunity to present its views on fiscal year 1983 defense appropriations.

The views which will be discussed today represent the consensus opinion of the 2.7 million members of the American Legion. Overall, the Legion is pleased with the recent progress which has been made for the modernization and rebuilding of our Nation's defenses. However, following a decade of reduced development and slowed research it will take a large measure of national will and resources to rebuild the weapon systems which are required by our outnumbered forces to provide a significant deterrent and, if necessary, confront and fight an aggressor.

We say this keeping in mind, however, that the Armed Forces should be designed first as a deterrent acting in an offensive capacity only after active military aggression by others. Our Armed Forces must be structured and equipped so as to insure against either military or diplomatic action against the United States.

U.S./NATO COOPERATIVE

To augment our ability to deter aggression the United States must remain committed to cooperation with our NATO allies in an effort to continue to maintain peace through a significant show of military strength and determination.

At this point we feel it is appropriate to direct our comments toward those particular issues which, in the Legion's view, warrant the careful consideration of the subcommittee as it begins to shape the appropriations package which will dictate the direction of the U.S. Armed Forces in fiscal year 1983.

It has been several years since the American Legion began to advocate the need to modernize the U.S. Navy through the construction of new, large-deck, nuclear-powered aircraft carriers. A U.S. carrier battle group has all of the necessary defense capabilities required to successfully fend off most types of air attacks.

E–2C AIRBORNE EARLY WARNING SYSTEM

The E–2C airborne early warning systems, a small version of our AWAC's, can be launched from the deck of a carrier. This aircraft provides the necessary umbrella of radar coverage needed to alert the fleet of attacking aircraft or missiles. Even if substantial numbers of enemy aircraft were encountered the antimissile capability available to the U.S. fleet could deal with any missile attack. The imminent addition of the Aegis antimissile defense system will significantly enhance this antimissle capability.

To sum it up, the critics of the large deck carrier concept ignore the offensive combat power and defensive capabilities inherent in this type of naval force. In light of these facts, the American Legion completely supports the recently passed Senate authorization of $7 billion for construction of two *Nimitz* class nuclear powered aircraft carriers.

M-1 TANK AND M-2 IFV

You may recall, Mr. Chairman, that last year we testified in favor of both the M-1 tank and the M-2 infantry fighting vehicle. We remained convinced that these two weapon systems will give the Army an enhanced combat capability on the battlefield. The M-1 tank has received a great deal of scrutiny by the Congress, both as to its increased cost and its combat capabilities.

Some groups have sought to kill the M-1 program, but to do so would deprive our soldiers of one of the best, most capable weapon systems ever designed for ground combat. Despite the attacks the M-1 has sustained, it remains the most advanced tank available in the world. The improvements in crew survivability and weapons accuracy make this system unsurpassed and the clear choice for our ground force combat units. The American Legion supports the Senate figure of $1.7 billion for procurement of 776 M-1 tanks.

M-2/M-3 BRADLEY FIGHTING VEHICLE

The M-2/M-3 Bradley fighting vehicle also represents a significant advance in ground combat equipment. We cannot afford to further jeopardize the lives of American troops by sending them into battle with 1950's technology when the M-2/M-3 systems are equipped with stabilized guns and antitank missiles which are far better able to defend the personnel they carry. Therefore, the Legion views the authorization level of $843 million as an appropriate figure necessary for the procurement of 600 M-2/M-3 Bradley fighting vehicles.

B-1B MANNED BOMBER

At this point, we would like to restate our support for the B-1B manned bomber. This subcommittee is well aware of the age of the B-52 fleet and the fact that its instrumentation and speed limitations have raised the question of its ability to effectively penetrate Soviet air space and delivery nuclear weapons. While the B-52 clearly need replacement because it is too old to perform this mission, we would suggest that it may be extremely useful if deployed against enemy naval units.

Pinpoint bombing with conventional bombers has not lost its usefulness in some areas of conflict. The B-52 has an excellent record in this role and will be useful for some years to come. Only the B-15, however, has any hope of surviving to accomplish the mission of penetration.

MX MISSILE

Because the Minuteman missile force has become increasingly vulnerable and lacks the accuracy and yield necessary to kill hard targets, we believe the United States must proceed with development of the MX. Failure to do so will send an inappropriate signal to our enemies and allies alike. The American Legion views the Senate figure of approximately $2.4 billion as critically short of the necessary funds requested by the administration. We applaud the amendment to require a basing mode by December 1 of 1982 and urge the subcommittee to bring the MX funding level back into line with the administration's request.

The economic problems currently plaguing the country have raised serious questions in the minds of some people as to whether or not this Nation can really afford to rapidly rebuild our defenses at this time. It is important to mention at this point that Legionnaires are taxpayers and as such are also concerned with cost increases in major weapon systems.

We recognize that overruns due to errors in design, increases due to inflation, changes in training requirements and procurement of spare parts ultimately result in fewer systems. Decisions concerning their procurement must be made carefully based on coherent analysis of each system and in an effort to avoid the recurrence of these problems.

The American Legion firmly believes that this Nation cannot afford to devote any less money to its national defenses. The current world economic situation and political climate clearly demand it. And while many cite our internal economic problems as justification for reduced defense spending, one thing is certain, that a weak defense posture will most assuredly bring the eventual downfall of weak and strong economies alike.

NATIONAL SECURITY OF THE UNITED STATES

To conclude, I would like to point out that during our 63d National Convention held last year in Hawaii the American Legion adopted 21 resolutions concerning the national security of the United States. Copies of the full text of each of these resolutions are appended to the statement and the rationale for the Legion's support for each position is contained therein.

We respectfully request that each of these resolutions be included in the record of these proceedings.

Thank you, Mr. Chairman, and I will be happy to answer any questions that I can.

Senator **Garn**. Thank you very much. We appreciate your testimony and your entire statement certainly will be included in the record.

Mr. **Olszewski**. Thank you.

[The prepared statement of Mr. Olszewski follows:]

The American Legion

Statement of

ALAN M. OLSZEWSKI, ASSISTANT DIRECTOR
NATIONAL LEGISLATIVE COMMISSION
THE AMERICAN LEGION

Thank you Mr. Chairman, for providing The American Legion the opportunity to present its views on FY 83 Defense appropriations. The views which will be discussed today represent the concensus opinion of Legion membership as adopted by the delegates to our 63rd annual National Convention held last year in Honolulu, Hawaii.

Overall, Mr. Chairman, The American Legion is pleased with the recent progress which has been made toward the modernization and rebuilding of our nation's defenses. However, following a decade of reduced development and slowed research it will take a large measure of national will and resources to rebuild the weapons systems which are required by our outnumbered forces to provide a significant deterrent and if necessary confront and fight an aggressor. We say this keeping in mind, however, that the armed forces should be designed first, as a deterrent; acting in an offensive capacity only after active military aggression by others. Our armed forces must be structured and equipped so as to insure against either military or diplomatic action against the United States. To augment our ability to deter aggression, the United States must remain committed to cooperation with our NATO allies in an effort to continue to maintain peace through a significant show of military strength and determination.

At this point, Mr. Chairman, we feel it is appropriate to direct our comments toward those particular issues which, in the Legion's view, warrant the careful consideration of the Subcommittee as it begins to shape the appropriations package which will dictate the direction of the U.S. Armed Forces in FY 83.

Large Deck Carriers and Navy Modernization

It has been several years since The American Legion began to advocate the need to modernize the U.S. Navy through the construction of new, large deck nuclear powered aircraft carriers. This belief has been strengthened by the current crisis in the Falkland Islands. The British clearly lack adequate air cover which has cost them the destroyers Sheffield and Coventry at the hands of the Argentine air advantage. While this has been cited by naval critics as proof positive that surface ships are obsolete in an era of Exocet, Harpoon and Tomahawk missiles, nothing could be further from the truth.

Most discussions of surface ship obsolescence ignore the fundamental differences in the make up of the British task force and that of a U.S. Carrier Battle group. The British have utilized two small aircraft carriers with no more than 35 SEA HARRIER jets and a number of helicopters. Lacking both the ability to deploy airborne warning system aircraft from the carriers and a readily accessible airfield, the British have been unable to utilize their version of our AWACs planes, the NIMROD. The limited fuel capacity of the Sea Harriers and the lack of carrier launched refueling aircraft preclude their use for long range patrol missions to protect the fleet. Thus, the Sheffield, lacking sufficient air cover, fell victim to the Argentine pilot flying a French Super Entendard equipped with Exocet missiles. Being able to fly at undetectably low altitudes, the Argentine pilot was able to jump up, lock the Exocet missile on target and drop back to his original altitude and escape. With no anti-missile capability and no air cover, the Sheffield was fatally vulnerable.

In contrast, a U.S. Carrier Battle Group has all of the necessary defensive capabilities to prevent the occurance of the above chain of events. The E-2C Airborne Early Warning aircraft had been offered at one time as a alternative to much larger E-3 AWACs. It can provide the necessary early warning data concerning the approach of enemy aircraft in time for the carrier to deploy sufficient airpower to combat the threat. Even if substantial numbers of enemy aircraft were encountered the anti-missile capability available to the U.S. Fleet could deal with any missile attack. The imminent addition of the AEGIS anti-missile defense system will significantly enhance this anti-missile capability. To sum it up the critics of the large deck carrier concept totally ignore the offensive combat power and defensive capabilities inherent in this type of naval force. In light of these facts, The American Legion completely supports the recently passed Senate authorization of $7 billion for construction of two Nimitz-class, nuclear-powered aircraft carriers.

Modernization of the Army

You may recall, Mr. Chairman, that last year we testified in favor of both the M-1 tank and the M-2 infantry fighting vehicle. We remain convinced that these two weapons systems will give the Army an enhanced combat capability on the battlefield.

The M-1 tank has received a great deal of scrutiny by the Congress both as to its increased cost and its combat capabilities. The media have also focused on its alleged shortcomings and while some groups have sought to kill the program, to do so would deprive our soldiers of one of the best, most capable weapons systems ever designed for ground combat. Despite the attacks the M-1 has sustained, it remains the most advanced tank available in the world. The improvements in crew survivability and weapons accuracy make this system unsurpassed and the clear choice for our ground combat forces. The American Legion supports the Senate figure of $1.7 billion for procurement of 776 M-1 tanks.

The M-2/M-3 Bradley Fighting Vehicle also represents a significant advance in ground combat equipment. The American Legion believes this vehicle is an essential element of the Army's modernization efforts. There is an urgent need to equip our troops with this vehicle. We cannot afford to further jeopardize the lives of American troops by sending them into battle with 50's technology when the M-2/M-3 systems are equipped with stabalized guns and anti-tank missiles which are far better able to defend the personnel they carry. Therefore, the Legion views the authorization level of $843 million as an appropriate figure necessary for the procurement of 600 M-2/M-3 Bradley fighting vehicles.

Mr. Chairman, the Army has been attempting to field an all-weather attack helicopter since the mid-1960's. During the same period of time, the Soviets have been successful in deploying their version of this helicopter. As witnessed by events in Afghanistan, they have also successfully utilized this helicopter in combat. The Soviets have even shipped the HIND-D armored, all-weather helicopter to Cuba. The ability of this helicopter to engage in offensive attacks day or night, good weather or bad, make it a formidable weapon which could easily defeat conventional forces, particularly during night manuvers and foul weather. We in the United States have been overly concerned with the cost increases of the AH-64 program, resulting in the fact that the U.S. Army is still without an all-weather attack helicopter. A careful analysis of the figures shows that the acutal growth in total procurement cost of $710,000 per aircraft represents less than a ten percent increase over prior cost estimates and compares favorably with other weapons programs during the transition phase from R&D to procurement. The American Legion would like to express concern over the Senate's decision to defer the $793 million requested to produce 48 AH64 helicopters with the exception of $73 million for production options in FY 84. Aside from the obvious inflationary cost increases which will continue to occur during the deferral period, the fact remains that the Soviet built HIND-D helicopter is currently being successfully deployed and poses a substantial threat to our conventional ground forces. We request that the Subcommittee carefully reevaluate this decision keeping in mind the clear Soviet advantage in this particular area.

Air Force Strategic Programs

The American Legion for some years now has advocated an upgrading of the manned Bomber Force. In this regard, we deem it vital to proceed with development and deployment of the B-1B manned penetrating bomber. This weapon would replace the aging B-52 as the third and most flexible leg of the strategic TRIAD. This Subcommittee is well aware of the age of the B-52 fleet and the fact that its instrumentation and speed limitation have raised the question of its ability to effectively penetrate Soviet airspace to deliver nuclear weapons. Therefore, the budget request for the B-1B is supportable on the grounds that the B-52 clearly needs replacement as it is too old to perform this mission. We would suggest, however, that the B-52 may be extremely useful if deployed against enemy naval units. Pinpoint bombing with conventional weapons has not lost its usefulness in some areas of conflict. The B-52 has an excellent record in this role and will be useful for some years to come. Only the B-1B, however, has any hope of surviving to accomplish the mission of penetration.

As is widely supposed, the Minuteman missile force is now vulnerable to a Soviet first strike. The Minuteman also lacks the accuracy and yield necessary to kill hard targets. For these reasons, we believe the U.S. must proceed with the development of the M-X. Failure to do so will send an inappropriate signal to our enemies and allies alike. We have not taken a stand on how to base the M-X on a permanent basis, however, we would suggest that fixed silo basing on a temporary basis is better than non-deployment of this important weapons system. As such, The American Legion views the Senate figure of approximately $2.4 billion as critically short of the necessary funds requested by the Administration. We applaude the amendment to require a basing mode by December 1, 1982 and urges this Subcommittee to bring the MX funding level back into line with the Administration's request.

The economic problems currently plaguing the country have raised serious questions in the minds of some people as to whether this nation can really afford to rapidly rebuild our defenses at this time. It is important to mention, at this point, that Legionnaires are also taxpayers, and as such are also concerned with cost increases in major weapons systems. We recognize that overruns due to errors in design, increases due to inflation, changes in training requirements and procurement of spare parts ultimately result in fewer systems purchased. Decisions concerning their procurement must be made carefully, based on coherent analysis of each system in an effort to avoid the reoccurence of these problems.

In late 1981, the Secretary of Defense had his staff analyze the effects of increases in defense spending on federal tax receipts. This analysis showed that an increase in defense spending of $1.00 will return, on average over a four year period, about $ .77 in federal tax receipts. Federal expenditures would increase by $1.16 (due to a slightly higher federal debt burden and increased CPI). The net impact then on the federal deficit would be an increase of just $ .39. The analysis also showed that an increase in federal government transfers to individuals would return, on average, just $ .44 in federal tax receipts. Federal expenditures would increase by $1.21 (due to an even higher federal deficit that results in an even greater federal debt burden). The net impact then on the federal deficit would be an increase of $ .77.

What we are suggesting is that this nation cannot afford to devote any less money on its national defenses. The current world economic situation and political climate clearly demand it, and while many cite our internal economic problems as justification for reduced defense spending, one thing is certain, a weak defense posture will most assuredly bring the eventual downfall of both weak and strong economies alike.

To conclude, I would like to point out that during our 63rd National Convention held last year in Honolulu, The American Legion adopted 21 resolutions concerning the national security or the United States. Copies of the full texts of each of these resolutions are appended to this statement, and the rationale for the Legion's support for each position is contained therein. We respectfully request that these resolutions be included in the record of these proceedings.

Mr. Chairman, I would like to thank you and the members of the Subcommittee for your interest in the viewpoint of The American Legion on FY 83 DoD Appropriations.

RESOLUTIONS

63rd NATIONAL CONVENTION OF THE AMERICAN LEGION
HELD IN HONOLULU, HAWAII
SEPTEMBER 1-3, 1981

RESOLUTION 15

COMMITTEE: National Security

SUBJECT: ROTC AND JUNIOR ROTC PROGRAM FUNDING

WHEREAS, The American Legion has always supported the maintenance of an armed force sufficiently strong to defend the United States of America in time of national emergency; and

WHEREAS, the armed forces are suffering a severe shortage of non-commissioned and petty officers; and

WHEREAS, the Reserve Officers Training Corps and the Junior Reserve Officers Training Corps are a primary means of building a reserve pool of such potential personnel; and

WHEREAS, the number of ROTC and Junior ROTC programs in our colleges and high schools are limited by the amount of funds made available to support these programs; and

WHEREAS, the current Administration, through its party platform, advocated a strong national defense position; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that the Congress of the United States of America be urged to appropriate additional funds earmarked for ROTC and Junior ROTC programs in order to permit greater participation in these programs, thus increasing the reserve pool of trained personnel available to our armed forces.

RESOLUTION 34

COMMITTEE: National Security

SUBJECT: OPPOSE LEGISLATION THAT WOULD REDUCE THE SALARIES OF MILITARY RETIREES

WHEREAS, a bill has been introduced into the U.S. House of Representatives that if passed would reduce the salaries of military retirees who have been employed by the U.S. Postal Service, and all government agencies, reduce them full military retirement pay; and

WHEREAS, this bill if passed would not allow a military retiree to reap the benefits of his full retirement pay and also earn the full government agency salary to which he would be entitled; and

WHEREAS, this bill if passed, would discriminate against military retirees who are employed by U. S. Government agencies in regard to their salaries and military retirement pay; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we oppose legislation which would reduce the salaries of military retirees employed by the Federal Government.

RESOLUTION 52

COMMITTEE: National Security

SUBJECT: M-X MISSILE

WHEREAS, the land-based intercontinental ballistic missile (ICBM) is a cornerstone of our national strategy deterrent; and

WHEREAS, under the provisions of the interim SALT agreement, Soviet strategic forces are numerically superior to those of the United States and the Soviets deploy three times the missile throw-weight of comparable U.S. forces; and

WHEREAS, the Soviet Union has initiated new ICBM programs representing a massive effort in the form of new missiles, new bus-type dispensing systems, new Multiple Independent Targetable Re-entry Vehicle (MIRV) payloads, new guidance systems, new type silos, new launch techniques, and probably new warheads; and

WHEREAS, all available evidence suggests that targeting our ICBM silos continues to be high priority for the Soviet ICBM force; and

WHEREAS, in first strike capability by the Soviet Union would destroy the balance of strategic weapons between us; and

WHEREAS, a Secretary of Defense has stated that "reducing the vulnerability of the land-based ICBM force is the highest priority strategic initiative in the Department of Defense five-year program;" and

WHEREAS, the Air Force has undertaken programs to improve the accuracy yield and survivability of its Minutemen missiles including improved guidance and propulsion, Mark 12A to increase the warhead yield and hardening of the silos; and

WHEREAS, in the long run the M-X missile provides the most promising ICBM initiative for preserving essential equivalence; and

WHEREAS, survivability is a dominant concern the M-X ICBM modernization program and Defense Department has proposed various basing modes for the deployment of the M-X missile designed to enhance such survivability through locational uncertainty and mobility; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that the Administration and the Congress be urged to provide full support to Defense Department efforts to develop and deploy the M-X missile as expeditiously as possible to insure that the U.S. does not allow the Soviet Union to achieve a position of startegic superiority inimicable to our national security interests.

RESOLUTION 58

COMMITTEE: National Security

SUBJECT: EDUCATION INCENTIVES FOR ACTIVE AND RESERVE FORCES

WHEREAS, Congress has terminated the education program under Chapter 34, Title 38, United States Code, for those persons enlisting in the Armed Forces of the United States on or after January 1, 1977; and

WHEREAS, Congress replaced this educational assistance program with a less generous experimental contributory program under Chapter 32, Title 38, which is known as the Post-Vietnam Era Veterans' Educational Assistance Program, or "VEAP," wherein the Federal Government matches on a two-to-one basis the deposits by the individual military member to VEAP up to $5,400; and

WHEREAS, the Secretary of Defense is authorized under this program to contribute additional unspecified amounts to an individual's VEAP account above that level as a recruiting or retention incentive; and

WHEREAS, the Department of Education now provides without service requirement, direct and guaranteed student loans with minimal interest rates which do not require repayment to commence until 9-12 months after graduation with complete repayment within 10 years; and

WHEREAS, all military services are experiencing great difficulty in recruiting and retaining military personnel and it is apparent that this problem will worsen in the 1980s as the number of 18-year old men decline to 1.7 million in the latter part of the decade, thus requiring the services to recruit 50% of all military age males who are physically and mentally qualified and who are not enrolled in college in order to meet the manpower needs of the services; and

WHEREAS, The American Legion believes that educational incentives play an important part in the recruitment and retention of personnel, and any attempt to restrict or delete such benefits as a cost-saving measure would adversely affect the military services ability to meet their accession and retention goals; and

WHEREAS, The American Legion believes that the declining numbers of 18-year old men will likely force resumption of the draft, and will encourage Congress to authorize an education incentive program as a readjustment benefit comparable to those that were provided under Public Law 89-358, the so-called "Cold War Veterans Readjustment Act;" now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge Congress to enact legislation which would authorize and fund an education incentive program to support retention and recruiting for Active and Reserve Forces, examples of which follow:

1) As a pre-service benefit, a loan forgiveness program for direct or guaranteed educational loans by the Federal Government which would reduce or cancel such loans through honorable military service;

2) As an in-service benefit, the current 75% limitation on in-service tuition assistance could be expanded to provide payment of 90% of instructionally related expenses as well as basic tuition costs or fees in lieu of tuition;

3) As a post-service benefit, educational benefits patterned after Chapter 34, or VEAP programs, could be extended to those who do not avail themselves of either the pre-service or in-service programs; and, be it further

RESOLVED, that The American Legion recommend to Congress that any such educational incentive program be funded as a Department of Defense function but be administered by the Veterans Administration since the VA currently has staff and expertise to administer such a program.

RESOLUTION 86

COMMITTEE: National Security

SUBJECT: AIRLIFT CAPABILITY

WHEREAS, rapid reinforcement and world-wide mobility are major elements of the defense policy of the United States; and

WHEREAS, rapid mobility is essential to deterrence and it is imperative that the total mobilization airlift capability of the United States be maintained at a level of need; and

WHEREAS, current airlift deficiency is judged to be the greatest problem the U.S. Air Force faces in executing national military strategy; and

WHEREAS, the Secretary and Chief of Staff of the U.S. Air Force have testified that the procurement of a new airlift, the C-X, is the top priority of the Air Force in the mobility area and is essential to their needs; and

WHEREAS, the availability of the C-X is essential to rapid reinforcement and world-wide mobility of the armed forces of the United States; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Congress of the United

States to authorize funds required for the development of C-X aircraft or other comparable aircraft to insure that sufficient airlift capability will be available in future years to provide for rapid deployment of the armed forces of the United States if it becomes necessary to prevent infringement upon the vital interests of the United States anywhere in the world by any potential aggressor.

RESOLUTION 87

COMMITTEE: National Security

SUBJECT: AIRBORNE WARNING AND CONTROL SYSTEM PROGRAMS

WHEREAS, future demands on our surveillance, warning and control capabilities in support of tactical air operations, particularly in the context of a European conflict, will be quite severe; and

WHEREAS, an AWACS system has been developed by the U.S. Air Force consisting of an advanced radar system mounted in a Boeing 707 F-3A aircraft with associated data processing and communication equipment; and

WHEREAS, the fundamental requirement for AWACS is driven by the rapidly growing ability of Soviet built aircraft to penetrate defenses at very low altitudes, screened from the view of ground radar systems; and

WHEREAS, flight demonstrations in Europe, as well as in the United States, have confirmed the ability of AWACS to inter-operate with the NATO air defense system and to provide unprecedented long-range airborne surveillance and warning that are vital for credible deterrence in peacetime and for the precise control of forces engaged in combat in the event of conflict; and

WHEREAS, the AWACS can be deployed to any region of the world, and immediately begin its mission of surveillance, warning or direction of air-to-air or air-to-surface combat operations and its inherent mobility, coupled with its long-range enabling it to perform its mission while remaining outside the threat area of enemy surface-to-air missiles or fighter aircraft; and

WHEREAS, the view provided decision makers by AWACS of the battle area and the collection and dissemination of on-time data such as position and track information on enemy aircraft and ships and the location and status of friendly ground troops will improve by order of magnitude the centralized, timely management of national assets; and

WHEREAS, complementing our national AWACS program is our planned participation in the proposed NATO AWACS program, the largest, single commonly funded project ever undertaken by NATO; and

WHEREAS, the AWACS will also be an essential element of our air defense system in the United States—a role which has acquired even greater significance in view of the new Soviet supersonic bomber, the Backfire, and the long-term reduction in size of our dedicated air defense interceptor force; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Administration and the Congress to continue to support the U.S. Air Force and its efforts to procure a sufficient number of AWACS to meet national defense requirements, now and in the future.

RESOLUTION 88

COMMITTEE: National Security

SUBJECT: STRATEGIC NUCLEAR FORCES

WHEREAS, over the past decade the United States has unilaterally restrained, deferred and cancelled programs that would have modernized our strategic nuclear forces, while the Soviet Union during the same period, has engaged in an unprecedented modernization and build-up of their strategic nuclear forces to a point that they have already surpassed the United States in some areas and their momentum will allow them to gain an advantage over the United States in most of the major statistical indicators of strategic force by the early 1980s; and

WHEREAS, because of lead times in modern weapons programs, this progressive shift in strategic balance will continue into the latter part of the 1980s when our modernization programs may be far enough along to restore full strategic parity; and

WHEREAS, we face a period of high risk and great uncertainty in the strategic balance throughout the coming decade, and only through resolutely pursuing modernization can we overcome 15 years of damaging neglect; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that the United States must not let the Strategic Arms Limitation Treaty (SALT II) ratification process divert our attention from the pace of strategic imbalance between the United States and the USSR; and, be it further

RESOLVED, that the United States must recognize that it is absolutely essential that we proceed with our submarine launched ballistic missile modernization program, the development and deployment of the MX missile, rapid deployment of the air launched cruise missile, and the development of a manned penetrating aircraft to succeed our aging B-52s in order to retain the flexibility and effectiveness of the strategic TRIAD.

RESOLUTION 90

COMMITTEE: National Security

SUBJECT: MILITARY PAY

WHEREAS, adequate funds have not been made available to the Department of Defense for the purchase of sophisticated military hardware and for adequate compensation for members of the armed forces; and

WHEREAS, the all-volunteer force has not been successful due to the limited salaries paid to members of the armed forces; and

WHEREAS, many service personnel on active duty are participating in government subsidy programs, such as the food stamp program, in order to support their families; and

WHEREAS, the spiraling cost of living affects active duty personnel and their families equally as hard as others; and

WHEREAS, the nation must provide adequate compensation for active duty personnel in order to maintain a strong national defense; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the President of the United States and the Congress to provide adequate funds to the Department of Defense to increase compensation across the board for all active duty military personnel comparable to that paid like responsibility in civilian life.

RESOLUTION 130

COMMITTEE: National Security

SUBJECT: U.S. ARMED FORCES MEDICAL CARE

WHEREAS, the Congress of the United States is responsible for a strong military defense; and

WHEREAS, Congress has the responsibility of providing members of the armed forces adequate living conditions, including medical services; and

WHEREAS, due tc the curtailment of medical services at many active military installations, members of the armed forces cannot receive adequate medical care for himself and his family; and

WHEREAS, in a number of instances, medical services are contracted out at a greater expense and results in a lower quality of medical care to the troops; and

WHEREAS, the Department of Defense is considering a proposal to utilize an active military hospital to contract with private individuals or organizations to provide medical services to military troops and their families and retirees; and

WHEREAS, it would not be economically advantageous to the government and would certainly not be medically advantageous to the troops by having a private contractor operate a military hospital; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that it does go on record opposing the Department of Defense contracting with private organizations for medical services in a military hospital for members of the armed forces, their dependents, retirees and their dependents; and, be it further

RESOLVED, that Congress appropriate sufficient funds to provide military medical staff to adequately care for active members of the armed forces, their dependents, retirees and their dependents.

RESOLUTION 133

COMMITTEE: National Security

SUBJECT: NATIONAL DEFENSE

WHEREAS, the citizens of the United States, and especially the war veterans, have supported the Congress in providing adequate funds for a strong military defense program; and

WHEREAS, during the past few years, sufficient funds have not been provided to maintain a first class military defense for the United States; and

WHEREAS, this nation cannot afford a second class defense program of materials and manpower; and

WHEREAS, we the people of a free democratic society, must continue to support a defense program-adequate to protect our freedom at all costs; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we request the Congress of the United States to provide adequate funds to cause the United States to have a first class defense program, including adequate hardware, a highly competent military force and an effective, efficient medical program for members of the armed forces and their families.

RESOLUTION 161

COMMITTEE: National Security

SUBJECT: AERIAL REFUELING CAPABILITY/KC-135A TANKER AIRCRAFT

WHEREAS, various Air Force analyses show that additional aerial refueling capability is needed for optimum bomber penetration routes to support the Single Integrated Operational Plan (SIOP); and

WHEREAS, the requirement for tanker support will increase when the B-52Gs begin to carry Air Launched Cruise Missiles (ALCMs) externally; and

WHEREAS, this strategic planning problem is compounded by the requirement to refuel airlift and tactical aircraft for contingency operations; i.e. NATO, Mid-East; and

WHEREAS, present aerial refueling requirements for combined SIOP and contingency missions exceed the current capabilities to such an extent that during simultaneous operations these missions would be seriously degraded due to tanker deficiencies; and

WHEREAS, there are various operational and environmental problems with the KC-135A as currently engined, including limited thrust and fuel offload capabilities, excessive engine noise, chronic take-off thrust problems and gaseous emmissions; and

WHEREAS, recent evidence also shows water requirements would be a problem for those KC-135s involved with operations in scarce water areas such as the Mid-East; and

WHEREAS, re-engining the KC-135 with the CFM-56 engine will increase fuel offload capabilities at all refueling ranges, improve engine thrust, reduce basing constraints, and save 180,000 gallons of fuel per aircraft per year; and

WHEREAS, the re-engined KC-135 is six times quieter and substantially less polluting then the current KC-135A; and

WHEREAS, the Air Force objective is to provide an acceptable level of refueling support to strategic bombers, tactical fighters and long-range strategic transports across a range of possible scenarios and, in view of political realities and uncertainties, plans must be made to provide this refueling support without enroute basing; and

WHEREAS, our air refueling force must be able to respond to Administration concerns for a global response capability and the ability to support a protracted conflict; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Administration and the Congress to support the Air Force program to re-engine its KC-135A tanker force with new, quieter, fuel efficient engines which will provide the capability in the years ahead to meet the refueling requirements of our strategic, tactical and airlift forces.

RESOLUTION 163

COMMITTEE: National Security

SUBJECT: TACTICAL AIRCRAFT

WHEREAS, for the United States to be capable of protecting its world-wide interests we must be able to respond with military power when our interests, or those of our allies, are threatened and military force is deemed appropriate; and

WHEREAS, the erosion of our strategic nuclear superiority has reduced the deterrent value of the nuclear umbrella as well as increased the reliance upon and the contribution of conventional forces to our over-all deterrent strength; and

WHEREAS, the primary threat to our general purpose forces continues to be the Soviet Union/Warsaw Pact; and

WHEREAS, the continued rapid introduction and production by the Soviets of new, more modern and sophisticated tactical systems may soon have us facing a force that is not only vastly superior numerically, but one that is comparable qualitatively; and

WHEREAS, the most demanding conventional threat facing the United States is an armored attack on Western Europe by the Warsaw Pact; and

WHEREAS, NATO plans rely heavily on the flexibility of tactical air power to be able to shift combat power rapidly to threatened sectors; and

WHEREAS, our tactical Air Force must not only aid in blunting an attack along the forward line, but must also provide the capability to delay, disrupt and destroy enemy reinforcements and resupply; and

WHEREAS, since only a limited number of tactical aircraft may be deployed during early critical phases of a contingency, it is essential that they represent the best our country can field in order to signal our determined resolve to end the conflict on terms favorable to the United States; and

WHEREAS, the national requirement demands the flexibility and capabilities provided only by tactical fighters possessing superior performance, fire control systems, and armaments; and

WHEREAS, it is imperative, therefore, that the United States maximize the capabilities of the forces that are programmed and to build upon those forces to deter a present, ever-growing threat; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we strongly urge the Administration and the Congress to fully support the Air Force efforts to increase the production rates and capabilities of our tactical aircraft so that older, less capable aircraft in our Active and Reserve units may be replaced as quickly as possible.

RESOLUTION 204

COMMITTEE: National Security

SUBJECT: MODERNIZATION OF THE U.S. AIR FORCE

WHEREAS, every major conflict since World War I has demonstrated the need for air superiority in order to conduct successful ground combat against an armed hostile force; and

WHEREAS, the Soviet Union now possesses the requisite number of aircraft to potentially deny air superiority to the U.S. in an armed conflict involving those two nations; and

WHEREAS, Soviet use of air power has allowed them to challenge U.S. influence in areas of the world most critical to the security of the United States; and

WHEREAS, our national survival and the security of our allies depend on the ability of the U.S. to maintain air superiority in order to foster the strategic airlift capability, the close air support capability, and the strategic combat capability of the U.S. Air Force; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Administration and the Congress to act immediately to provide the necessary funding to modernize the U.S. Air Force in order to maintain the most up-to-date equipment available for close air support capability, strategic airlift and air superiority roles assigned as the Air Force mission.

RESOLUTION 211

COMMITTEE: National Security

SUBJECT: NATIONAL DEFENSE

WHEREAS, The American Legion traditionally has favored strong military forces for the United States; and

WHEREAS, the position of the United States as a world power has been diminishing in recent years to the detriment of the regard in which citizens of the United States are held in the world as indicated, for example, by the shameful imprisonment for 444 days of 52 Americans by the government of Iran; and

WHEREAS, the Government of the United States is considering increased spending to repair and improve our defenses; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Congress to pass legislation to strengthen America's ability to defend itself and to exert influence for peace, by improved weapons, training and sufficient pay and benefits to attract able, determined and patriotic men and women to the Armed Forces.

RESOLUTION 307

COMMITTEE: National Security

SUBJECT: BEAM WEAPONS

WHEREAS, energy beam weapons are being tested by both the United States and the USSR; and

WHEREAS, some intelligence sources estimate that the USSR has spent from $10-25 billion in a development effort for 20 years; and

WHEREAS, the United States has spent only $1.5 billion on "directed energy" research in the past decade; and

WHEREAS, while U.S. weapon scientists have been restricted largely to researching and testing beam weapons, the Soviets have pushed ahead with the development of actual weapons; and

WHEREAS, intelligence officials are in general agreement that the Soviet Union has a laser system that is capable of destroying low orbiting American satellites; and

WHEREAS, an authoritative intelligence estimate reported to the Administration in May 1980 that evidence shows the USSR is working on a satellite-killing laser weapon which could be deployed in space by the mid-1980s; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge a greater effort by the United States in researching and developing beam weapons particularly in high energy laser (HEL) and the charged particle beam (PB); and, be it further

RESOLVED, that we urge vigorous research into the feasibility of satellite based anti-ballistic missile weapons.

RESOLUTION 317

COMMITTEE: National Security

SUBJECT: UNITED STATES ARMED FORCES - QUALITY OF LIFE ASPECTS

WHEREAS, quality of life embraces a number of programs and individual projects designed to create an environment that recognizes that our Armed Forces are our most important asset. These include but are not limited to: military construction and operational funding programs for medical, housing, child care, education, religious, postal, recreational and other community facilities; and

WHEREAS, former Secretary of Defense Harold Brown stated in his Annual Report to Congress for Fiscal Year 1982, that the human dimension of military life - the job, living and recreational conditions - is a highly pertinent factor in the recruitment, retention, discipline, morale and readiness of military members; and

WHEREAS, General Frederick C. Kroesen, Commander-in-Chief, United States Army Europe and Seventh Army, has reported to Congress that certain elements of theSeventh Army stationed in Germany are living and working in facilities that are old, obsolete and "generally appalling;" and

WHEREAS, National Commander Michael J. Kogutek has visited Germany during 1981 and found generally that working and living conditions of American armed forces personnel stationed in Germany are "deplorable;" now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Department of Defense investigate all quality of life aspects pertaining to our armed forces personnel stationed not only in Germany but in other parts of the world and that Congress authorize and fund sufficient monies to bring these quality of life items up to the dignity and quality which befits those personnel guarding our liberty and freedom.

RESOLUTION 334

COMMITTEE: National Security

SUBJECT: MODERNIZE THE UNITED STATES NAVY

WHEREAS, the United States is a maritime nation with national security interests extending far beyond its boundries; and

WHEREAS, a strong, balanced naval force is essential to our forward strategy and the Navy and Marine Corps combine the offensive strength, mobility and endurance to operate virtually anywhere in the world where our interests, or those of our allies are located; and

WHEREAS, the ultimate U.S. maritime objective is to maintain a margin of maritime superiority over the Soviet Union sufficient to insure our ability to defeat the Soviet navy in a global war...and thus deter such a war; and

WHEREAS, the U.S. Navy today is deploying 20% above optimum rates; aircraft carriers are now exceeding optimum rotation rates by about 60%; and our ships and crews are now spending a greater percentage of time forward deployed than during the peak of activities in Vietnam; and

WHEREAS, during the past decade, the U.S. Navy fleet has declined from 847 ships and 8,000 aircraft to 530 ships and 5,400 aircraft, both active and reserve; and

WHEREAS, Secretary of the Navy John Lehman has stated that a benchmark of 600 ships is necessary given present world conditions, Soviet capabilities and the apparent dynamics of both; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we unequivocally support the benchmark of a 15-battle group Navy and strongly urge the Administration and Congress to move immediately, vigorously and resolutely toward this objective by authorizing and funding sufficient shipbuilding to meet the goals set forth by the Secretary of the Navy; and, be it further

RESOLVED, that we urge the President and the Congress to fund, build, equip and man a United States Navy that is clearly Number 1 in the world.

RESOLUTION 421

COMMITTEE: National Security

SUBJECT: A-10 AIRCRAFT

WHEREAS, Soviet strategy in Europe calls for round-the-clock operations designed to cause the quick collapse of NATO forces; and

WHEREAS, the Soviets, in open writings, say they intend to seize the initiative early; and

WHEREAS, with NATO forces in defensive positions, we can expect the Soviets to launch a classic break through attack to establish their preferred form of combat --a war of movement; and

WHEREAS, by combining mobility and massive firepower, the Soviets intend to keep NATO forces off balance and confused; and

WHEREAS, the A-10 aircraft is especially suited to blunting such an attack and providing capabilities to delay and disrupt the Warsaw Pact forces; and

WHEREAS, the A-10 aircraft has a rapid firing gun which is very effective against hard mobile targets, such as tanks, and can carry a full range of conventional ordnance, and with its GAU-8 30mm cannon and Maverick air-to-surface missiles, the A-10 aircraft is the most lethal anti-armor weapon system available; and

WHEREAS, its reliability and maintainability have exceeded Air Force expectations; and squadrons assigned to USAFE have successfully operated from forward operating locations in the Federal Republic of Germany; and

WHEREAS, hundreds of thousands of operational flight hours and joint tests with the Army have demonstrated the outstanding capabilities of this aircraft to perform close air support; and

WHEREAS, the outstanding capabilities of this aircraft will further be enhanced through modification to a two-seat configuration which can serve as a combat-ready trainer, resulting in savings both in fuel and training costs of several millions of dollars per year; and

WHEREAS, the two-seat A-10 could also be equipped to accept avionics to perform the night/adverse weather ground attack missions, thus preserving the near term option for that mission; and

WHEREAS, the Air Force has already introduced new A-10s directly into Reserve forces to accelerate total force modernization; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Administration and the Congress to support the A-10 program in both the single-seat and two-seat configurations, which will insure that American ground forces engaged in any future conflicts will have the best possible close air support that our technology and economy can provide.

RESOLUTION 425

COMMITTEE: National Security

SUBJECT: TRIAD CONCEPT AND STEALTH AIRCRAFT

WHEREAS, The American Legion has consistently supported the TRIAD concept of strategic deterrence which is based upon the mutual support provided each of the three elements thereof, i.e., submarine launched ballistic missiles, intercontinental land based ballistic missiles, and penetrating strategic bombers, by the other elements; and

WHEREAS, for several years The American Legion has supported Air Force efforts to develop and deploy a new long-range combat aircraft (LRCA) to replace part of the B-52 force which is 20-30 years old and which will be incapable of penetrating the sophisticated defenses expected to be in place in the Soviet Union in future years; and

WHEREAS, Congress has directed the Department of Defense to vigorously pursue full scale engineering development of a long-range combat aircraft maximizing range, payload and the ability to perform the missions of a conventional bomber, cruise missile launch platform, and nuclear weapons delivery system in both the tactical and strategic role, with an initial operational capability of not later than 1987; and

WHEREAS, It has been reported that the Air Force has recommended that approximately 100 B-1B aircraft be procured to fulfill this requirement in the near-term, followed by a second bomber force of approximately 110 advanced technology bombers, the so-called Stealth aircraft, in the 1990s; and

WHEREAS, the strength of a LRCA lies in its inherent flexibility, being much more than a penetrating aircraft in the traditional single integrated operational plan role, possessing in addition through its on-board offensive systems, the capability of detecting, identifying, and attacking mobile targets as well as imprecisely located targets; and

WHEREAS, in the conventional arena there is a growing need for platforms with self-contained capabilities to provide rapid, flexible response; and

WHEREAS, the aircraft's range, payload and advanced avionics would also substantially enhance collateral support for the U.S. Navy in sea surveillance and surface attack; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we urge the Administration and Congress to act as expeditiously as possible to provide full support to the Air Force in its effort to develop and deploy modern long-range combat aircraft in sufficient numbers at an early date to as to insure the effectiveness of the bomber element of TRIAD; and, be it further

RESOLVED, that we also urge the Administration and Congress to act as expeditiously as possible to support the development and deployment of the Stealth aircraft to meet our defense requirements.

RESOLUTION 428

COMMITTEE: National Security

SUBJECT: STRATEGIC NUCLEAR POLICY

WHEREAS, the United States has considered that nuclear war would essentially spell the destruction of civilization; a view which has led us to accept a steady erosion of our military strategic strength through successive enunciated policies which have only confirmed our diminishing relative strength; and

WHEREAS, the continued acceptance of such a policy will lead us to a position of inferior strategic strength, vis-a-vis the Soviet Union, by the mid-1980s; and

WHEREAS, a strategic policy which holds our own citizens hostage to nuclear exchange in order to deter aggression lacks credibility because of the Soviet's recently developed more accurate and more powerful MIRVed ICBMs, having first strike capability; and

WHEREAS, the Soviet Union strategists have long developed their military war machine from the concept of "winning" a nuclear war; and

WHEREAS, in developing their strategic nuclear offensive capability the Soviets have emphasized their Intercontinental Ballistic Missiles (ICBMs), and have been modernizing that force, stressing improved readiness, greater throw-weight, increase accuracy, better command and control; and

WHEREAS, they have also increased the number of re-entry vehicles, and provided hardened silos to improve survivability; and

WHEREAS, the development of new capabilities and rapid deployment of Anti-Ballistic Missiles (ABMs) including laser and other scientific break throughs, would enhance the survivability of our ICBMs, strategic bomber bases, defense communication sites, military facilities and the civilian populace; and

WHEREAS, at the present time, the U.S. has no effective defense against an attack by Soviet strategic aircraft; and

WHEREAS, the improvement of our manned and unmanned capability to intercept and destroy Soviet aircraft and cruise missiles would appreciably add to the deterrence of enemy attack; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we adopt a new strategic nuclear policy, which will lead the U.S. to develop the needed strength to destroy Soviet strategic offensive capabilities, rather than the destruction of soft targets; and, be it further

RESOLVED, that together with the development of these new capabilities that the United States develop the force structure necessary to defeat the Soviet Union, while minimizing destruction to the United States.

RESOLUTION 430

COMMITTEE: National Security

SUBJECT: NATIONAL DEFENSE

WHEREAS, the United States today is in greater danger than at any time since those early days of World War II after the surprise attack on Pearl Harbor; and

WHEREAS, over the past few years the over-all effectiveness of the United States armed forces has been eroding for various reasons, including the unsatisfactory recruitment of qualified applicants through the concept of a volunteer Army, the increased costs of modernization, the escalation of research and technological development costs and the inflationary rise of operations and maintenance costs; and

WHEREAS, during the Vietnam era research and development efforts were minimized in order to maintain and equip the forces in being for combat operations, depreciating and aging the operational vehicles and equipment that were the mainstay of our Navy, Army, Air Force and Marine Corps; and

WHEREAS, during this same period of time, the Soviet Union has been devoting massive resources out of its weak economy to building up its military might and has achieved military superiority in many areas; and

WHEREAS, the American people must recognize the threat to all peace loving, independent and open societies in the face of Soviet expansion and their use of surrogate forces in the spread of communism; and

WHEREAS, the United States is now faced with the choice of rapidly rebuilding our military forces so as to assure our survival as an independent, strong nation or we can accept the ultimate fate of the perilous course which we have been pursuing and prepare to live under the terms and conditions which will be dictated by the Soviet Union; and

WHEREAS, given such options there is no question but that the American people are prepared and willing to make such sacrifices as may be required of them to restore the military strength of the United States to a position where it cannot be challenged; and

WHEREAS, positive action has been taken in recent months to start the needed rebuilding of our military forces to the necessary levels of readiness with sufficient modern equipment; now, therefore, be it

RESOLVED, by The American Legion in National Convention assembled in Honolulu, Hawaii, September 1-3, 1981, that we fully support all such action by the Administration and the Congress to provide the personnel and equipment needed by our armed forces.

ASSOCIATION OF AMERICAN UNIVERSITIES, AMERICAN COUNCIL OF EDUCATION, NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND-GRANT COLLEGES, ASSOCIATION OF GRADUATE SCHOOLS, AND COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES

STATEMENT OF JAMES BROPHY, VICE PRESIDENT FOR RESEARCH, UNIVERSITY OF UTAH, ON BEHALF OF THE ASSOCIATION OF AMERICAN UNIVERSITIES, AMERICAN COUNCIL ON EDUCATION, NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND-GRANT COLLEGES, ASSOCIATION OF GRADUATE SCHOOLS, AND COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES

READINESS OF UNIVERSITY COMMUNITY

Senator **GARN**. Next I would like to invite to the witness table Dr. James Brophy, vice president of the Association of American Unversities.

Mr. Brophy, I am pleased to welcome you here this morning, not only on behalf of the subcommittee, but personally as a fellow Utahan.

Mr. **BROPHY**. Thank you, Senator.

The staff gave me a promotion. I am not vice president of the AAU. I am vice president of the University of Utah, but I will accept the promotion anyway.

Senator **GARN**. I just assumed that you were vice president of both. You have the same title both places, but the correction is probably more important as a graduate of the University of Utah than the whole association and we will accept that.

Mr. **BROPHY**. Thank you, Senator.

Mr. Chairman, I am here today to talk about the readiness of the university community, particularly the research universities to contribute to national security through research and teaching.

The Department of Defense budget for fiscal 1983 proposes several initiatives designed to strengthen the responsiveness of universities to the Nation's national security requirements.

My message on behalf of our research universities is a simple one. We urge your full support for the President's budget request for Department of Defense research, fellowship, and instrumentation programs.

My statement is presented on behalf of several higher education associations, the American Council on Education, the Association of American Universities, the Association of Graduate Schools, the Council on Graduate Schools in the United States, and the National Association of State Universities and Land-Grant Colleges.

I have submitted a formal statement supporting our position for the record, but in order to conserve time this morning I would like only to highlight that more detailed document.

For 40 years or more the working relationship among the university community, the military services and the Defense Department has been characterized by good science, good education, and good management. This relationship has not proceeded without interruption, but I believe that it has worked well in the long run.

The network of relationships springs from a tradition that extends backward at least as far as the Morrill Act of 1862. During the Second World War the Manhattan Project, the MIT Radiation

Laboratory, and many other scientific enterprises in support of the war effort drew heavily on the cooperation of scientists and our universities to pursue their missions. And in the immediate postwar period the Office of Naval Research became a major and a welcome center for fruitful scientific cooperation between universities and the Federal Government.

UNIVERSITY ROLE DURING VIETNAM WAR

Now during the Vietnam war the Defense Department's role in supporting university research and education was put under considerable strain, to say the least, and not the least because of the Mansfield amendment. I believe, Mr. Chairman, that the time has long passed to put that period behind us with its unhappy stresses and its formidable difficulties.

There are at least two reasons to do so.

First, when you look at the relationship between universities and the Federal Government from a broad perspective, that is from the end of World War II to the present, it is clear that the university community has valuable contributions to make to the security needs of the Nation and it has been traditionally willing to make them.

Second, national security more than ever demands a complete array of scientific, engineering, and other professional capacities. It also requires an educated populace and a productive economy. In many important ways, all of these depend upon the efforts of people in our colleges and our universities.

The University of Utah faculty, staff, and alumni have made important contributions to the public interest over the years, including the Nation's needs for security. As a matter of fact, research support from the basic research agencies in the Department of Defense at the University of Utah has increased more than 50 percent in the current academic year alone.

Therefore, I am happy to have this opportunity to give my views about the preparedness of the university community to reaffirm an old commitment and to realize that commitment in the form of new contributions to the Nation's security.

DOD/UNIVERSITY PRIORITY CONCERNS

In talking about the Defense Department's program to work with universities, I would like to emphasize the following three priority concerns.

No. 1. Insure a strengthen sustained commitment to the Nation's investment in research.

No. 2. Provide effective incentives to encourage our best students to pursue careers as scientists and engineers in those fields critical to our national security.

No. 3. Renew the research instrumentation and facilities of universities that perform DOD research programs.

With regard to the first concern, that is a sustained investment in research, the basic research programs of the Federal Government, including the Department of Defense, play an essential role in the Nation's continued economic development and defense.

The benefits to the country of sustained commitment to science are to some extent obvious. Basic research makes possible discoveries that can dramatically increase our ability to use natural phenomena for society's benefit. Achieving an understanding of electromagnetism, for example, vastly enlarged our ability to transmit energy and communicate with each other. Coming to understand the properties of materials ultimately led to the microprocessor. Understanding quantum theory has given us lasers. Understanding the chemistry of polymers has led to the production of a vast array of synthetic materials. And all of this is not new. Research by the Quartermaster Corps during the Civil War resulted in the development of left shoes and right shoes in contrast to the uncomfortable uniform boot common before that time.

American technology, in other words, draws its strength from that wide array of fundamental investigations into the nature of the universe, and this basic work goes on principally in academic environments.

In recent years, despite a strong bipartisan commitment to the continuing Federal responsibility for research, the Nation's support of our research enterprise has lagged seriously behind our foreign competition. The recent "Report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements" highlights some distressing trends in national research and development funding. For example, from 1968 to 1980 research and development funds as a fraction of the Federal budget are down 36 percent. Also research and development funds as a fraction of the gross national product are down 19 percent. And scientist and engineers engaged in R&D as a fraction of the labor force are down 9 percent.

Now the fiscal 1983 Department of Defense budget request for research, that is the 6.1 category, is $821.1 million. Of this the Defense Research Sciences programs of the Army, Navy, Air Force, and DARPA, which fund most of the DOD-supported university research programs, account for $768 million or about 93 percent.

Now the Department's basics research programs are a small but a vitally important part of the total effort. This effort measured in constant dollars remains below 1971 levels and, despite recent gains, is now restored to only two-thirds of the fiscal 1965 level.

The Senate Committee on Armed Services has supported the fiscal 1983 request for research and related programs. We urge you to join with the Armed Service Committee and fully support the President's request for DOD reserch.

My second concern about the Nation's need for scientists and engineers states that in many fields of science and engineering essential to the Nation's security and economic recovery we do face a shortage of Ph. D. engineers and scientists. Fields adversely affected include computer science and many subspecialties of engineering.

LACK OF STUDENTS PURSUING GRADUATE STUDIES

Talented U.S. undergraduates simply are not pursuing graduate studies in these fields in sufficient numbers to meet our Nation's needs. Many students now reject doctoral education for more promising and a highly competitive job market. And in that market universities frequently are at a competitive disadvantage in recruiting talented young faculty.

The present situation in our schools of engineering is particularly serious and illuminating. Undergraduate engineering enrollments are soaring toward record heights. The 1980 feshman engineering class nationwide was the largest ever recorded. Universities, however, lack the faculty and the talented graduate student assistants to handle that load efficiently and productively, and as a result more than 20 universities have announced limitations on enrollments rather than allow a decline in the quality of their educational programs.

The Defense Science Board gives several indicators of the problem's dimensions.

On of these is that between 1972 and 1980 the number of engineering Ph. D.'s granted declined 27 percent, all attributable to a decline in awards to U.S. citizens.

Another one is that the proportion of full-time graduate students enrolled in science and engineering rose from 16 percent in 1974 to 20 percent in 1979.

Now the problem here is not the number of foreign students enrolled in our programs. We have an excellent record and a responsibility to provide advanced education to students from other nations. The problem is that too few of the best American students are choosing graduate education over the job market and as a nation we are failing to attract our most able students into research and education careers.

In this connection, and if you will forgive a personal item, I would like to note that as a young research physicist I was fortunate enough to attract research support from the Office of Naval Research in the late 1950's and early 1960's. This funding helped me direct 10 graduate students to their advanced degrees in physics and electrical engineering. I cannot imagine a more effective expenditure of public moneys.

We are encouraged that the Department of Defense has responded to the requirements of the 1980's. DOD has announced a small—125 awards are planned in fiscal year 1983—targeted program of graduate fellowships in engineering and the sciences to attract the most able U.S. undergraduates to graduate programs in fields critical to our national security and economy. Under this new program stipends will be competitive in the job market.

We fully support the Department's proposal and we urge the committee to support it also. As the program is implemented we hope it will be possible to strengthen it further.

Finally, my third concern is on the obsolescence of research and laboratory facilities. Obsolete research instrumentation and outdated science and engineering laboratories are seriously hampering the efficiency and competitiveness of many Federal university research programs, including those that perform DOD-supported research.

AAU STUDIES

Two studies completed in 1980 and 1981 by the Association of American Universities documented the erosion of research instrumentation and laboratories in our leading universities. A July 1981 report [1] found that universities are able to meet approximately half of their accumulated needs for laboratory renovation, modernization, and replacement and for high-cost specialized research equipment.

For example, in recognition of the seriousness of this problem the Utah State Legislature has appropriated $500,000 to the University of Utah in each of the last 3 years to fund replacement and upgrading of sophisticated but outmoded research instrumentation. This is a very significant step, but the annual depreciation of research equipment at my university exceeds $2½ million.

Such serious unmet needs for laboratory renewal are also reported by other leading universities in many of the engineering and physical sciences laboratories that now perform, or are candidates to carry out, DOD research programs.

A June 1980 AAU report to the National Science Foundation stated that, "It is a telling fact that the equipment being used in top ranked universities has a median age twice that of the instrumentation available in leading industrial research laboratories." [2]

After reviewing the evidence, the Research Science Board drew a similar conclusion.

RESEARCH EQUIPMENT INITIATIVE

Supported by the Defense Science Board report, the Department of Defense in its fiscal 1983 budget request includes a special $30 million research equipment initiative designed to begin the task of upgrading engineering and science laboratories that carry out DOD-funded research. The Senate Armed Services Committee in its report on the fiscal year 1983 Department of Defense authorization quoted above, also supports this program.

We congratulate Under Secretary DeLauer and the Department for this initiative and we urge this committee to fund the Department's $30 million budget request for research instrumentation.

In conclusion, much of what I have said this morning is relative to the interests and responsibilities of other congressional committees and Federal agencies. In fact, last year I gave a similar message to the Senate Committee on Labor and Human Resources. The message is consistent because universities are a permanent and indispensable reservoir of talent for the Nation. By encouraging Department of Defense support for basic research and teaching, you will sustain a capacity that complements the much more highly focused and mission-oriented work in the Department's own laboratories.

Our best assurance against technological surprise, military or economic, is the encouragement of fundamental, in addition to mission-directed research. Given the facilities and equipment and a stable and open research environment and the talented young people to make the enterprise work, we need not worry about the ability of the Nation's universities to contribute to national security. That will take care of itself.

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[1] "The Nation's Deteriorating University Research Facilities: A Survey of Recent Expenditures and Projected Needs in Fifteen Universities." Association of American Universities, Washington, D.C., July 1981.

[2] "The Scientific Instrumentation Needs of Research Universities," National Science Foundation, June 1980.

Mr. Chairman, thank you very much for your kind attention.

[The prepared statement of Mrs. Brophy follows:]

PREPARED STATEMENT OF DR. JAMES J. BROPHY

VICE PRESIDENT FOR RESEARCH

UNIVERSITY OF UTAH

on behalf of the
Association of American Universities
American Council on Education
National Association of State Universities
and Land-Grant Colleges
Association of Graduate Schools
and
Council of Graduate Schools in the United States

Mr. Chairman and members of the Committee:

I am James Brophy, Vice President for Research of the University of Utah. I am here today to talk about the readiness of the university community, particularly research universities, to contribute to the national security through research and teaching. The DOD budget for FY 1983 proposes several initiatives designed to strengthen the responsiveness of universities to the nation's national security requirements. My message on behalf of our research universities is a simple one: we urge your full support for the President's budget request for DOD research, fellowship and instrumentation programs.

My statement is presented on behalf of the following higher education associations: the American Council on Education, the Association of American Universities, the Association of Graduate Schools, the Council on Graduate Schools in the United States and the National Association of State Universities and Land-Grant Colleges. I have submitted a formal statement supporting our position for the record. In order to conserve time this morning, I would like only to highlight that more detailed document.

For forty years or more, the working relationship among the university community, the military services, and the Defense Department has been characterized by good science, good education, and good management. This relationship has not proceeded without interruption, but I believe that it has worked well over the long run.

This network of relationships springs from a tradition that extends backward at least as far as the Morrill Act of 1862. That legislation, among other accomplishments, provided the statutory basis for the education in universities of Reserve officers. During the Second World War the Manhattan Project, the M.I.T. Radiation Laboratory, and other scientific enterprises in support of the war effort drew heavily on the cooperation of scientists and our universities to pursue their missions. In the immediate postwar period, the Office of Naval Research became a major and welcome center for fruitful scientific cooperation between universities and the Federal government

That experience laid the foundation for much of the partnership between government and universities in support of science and technology. Later on, the other services and the Office of the Secretary of Defense, together with the National Science Foundation, the Atomic Energy Commission, and the National Institutes of Health -- among others -- joined in building this country's magnificent scientific enterprise. That enterprise flourishes mainly in the nation's universities.

During the Vietnam War, the Defense Department's role in supporting university research and education was put under considerable strain, not least because of the Mansfield Amendment. I believe, Mr. Chairman, that the time has long passed to put that period, with its unhappy stresses and formidable difficulties, behind us. There are at least two reasons to do so. First, when you look at the relationship between universities and the Federal government from a broad perspective -- from the end of World War II to the present, for example -- it is clear the university community has valuable contributions to make to the security needs of the nation, and it has been traditionally willing to make them. Such contributions include scientific and technical research -- especially fundamental or basic research -- and the education and training of young people to sustain the knowledge and skills this country needs. I include in this category the education of new Reserve officers, as well as consultation with, and advice to, the Department and the services as they strive to accomplish their missions.

Second, national security more than ever demands a whole array of scientific, engineering and other professional capacities. It also requires an educated populace and a productive economy. In many important ways, all of these depend on the efforts of people in our colleges and universities.

The University of Utah faculty, staff, and alumni have made important contributions to the public interest over the years, including the nation's need for security. As a matter of fact, research support from the basic research agencies in DOD at the University of Utah has increased more than 50% in the current academic year alone. Therefore, I am happy to have this opportunity to give you my views about the preparedness of the university community to reaffirm an old commitment and to realize that commitment in the form of new contributions to the nation's security.

In talking about the Department's program to work with universities, I will emphasize the following three priority concerns:

I. Ensuring a Strengthened, Sustained Commitment to the Nation's Investment in Research

II. Providing Effective Incentives to Encourage our Best Students to Pursue Careers as Scientists and Engineers in Fields Critical to our National Security

III. Renewing the Research Instrumentation and Facilities of Universities that Perform DOD Research Programs

I. A Strengthened, Sustained Investment in Research

The basic research programs of the Federal government, including the Department of Defense plays an essential role in the nation's continued economic development and defense.

The benefits to the country of sustained commitment to science are to some extent obvious. Some of these benefits arise from the character of the research itself. Basic research makes possible discoveries that can dramatically increase our understanding of nature, and thus our ability to use natural phenomena for society's benefit. Achieving an understanding of electromagnetism vastly enlarged our ability to transmit energy and communicate with each other. Coming to understand the properties of materials ultimately led to the microprocesser. Understanding quantum theory has given us lasers. Understanding the chemistry of polymers has led to the production of vast array of synthetic materials. And all of this is not new. Research by the Quartermaster Corps during the Civil War resulted in left shoes and right shoes in contrast to the uncomfortable uniform boot common at the time. American technology, in other words, draws its strength from that wide array of fundamental investigations into the nature of the universe. This basic work goes on principally in academic environments.

In the military area, our defense rests on maintaining technological superiority. We simply cannot afford to be taken by technological surprise. the nation's best insurance against that contingency is a vigorous and vital scientific capacity, built upon a sustained commitment to basic research across the full spectrum of scientific and engineering endeavor.

Yet, in recent years, despite a strong bipartisan commitment to the continuing federal responsibility for research, the nation's commitment to our research enterprise has lagged seriously behind our foreign competition. The recent "Report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements" highlights the distressing trends in national R&D funding. From 1968 to 1980:

- R&D funds as a fraction of the federal budget -- down 36%
- R&D funds as a fraction of the GNP -- down 19%
- Scientists and engineers engaged in R&D as a fraction of the labor force -- down 9%.

Between 1968 and 1980 the Soviet Union, Germany and Japan increased their R&D investment as a percentage of GNP, and they increased the science and engineering component of their labor force. R&D funding as a fraction of GNP declined 19% between 1968 and 1980 in the United States; it increased in the USSR, Japan and West Germany by 14%, 19% and 16% respectively. Scientists and engineers as a fraction of the labor force declined 9% in the United States. This compares with increases of 62%, 70% and 75% in the Soviet Union, Japan and West Germany.[1] Thus despite an extraordinary record of accomplishment in science and engineering since the end of the second world war, our nation's commitment to research is now weakened.

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[1] Report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements, Office of the Under Secretary of Defense for Research and Engineering, Washington, D.C., January 1982, pg. 2-1-2-2.

The FY 1983 DOD budget request for Research (6.1 category) is $828.1 million; of this the Defense Research Sciences programs of the Army, Navy, Air Force and DARPA, which fund most of the DOD-supported university research programs, account for $768 million, or 93%. DOD basic research programs, however, are a small fraction (just 3%) of total DOD universities in R&D.

In dollars, and measured as a proportion of the total effort, the Department's basic research programs are a small, but vitally important part, of a much larger effort. In current dollars DOD basic research programs increase 21% over estimated FY 1982 levels. However, when converted to constant FY 1972 dollars, the increase is 11%, just slightly better than inflation. The real level of effort, measured in constant dollars, remains below 1971 and despite recent gains, is restored to only 2/3 that of the FY 1965 level. In contrast total R&D support measured in constant 1982 dollars, is restored to the near-record levels of the 1967-68 period.

The Senate Committee on Armed Services has fully supported the FY 1983 request for research and related programs. In their recent report (S. Rept. 97-330, p. 105-106) the Committee states:

> Defense Department University Research Support
>
> The committee has exaimned the recent report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements and other evidence documenting the deteriorating health of the Nation's research universities. The Committee is concerned that our leading research universities are suffering from a severe erosion in their capacity to conduct competitive research and advanced education programs in such key fields as science and engineering. Manifestations of such erosion may be found in the fact that many laboratories and much research equipment is seriously outdated. Moreover, insufficient numbers of talented students and researchers are

> being attracted to careers in fields of science and engineering essential to the Nation's future security. In short, the university research base in the United States is being dramatically weakened with grave implications for the national security.
>
> Consequently, the committee fully supports the proposed expansion of the Department's university research programs, the new research instrumentation program, the graduate fellowship program and other related steps planned by the Department, which have been incorporated in the fiscal year 1983 budget request. The Committee urges the Department further to strengthen these important programs in its submission of the fiscal year 1984 authorization request.

As this Committee considers the DOD budget request, we urge you to join with the Armed Services Committee and fully support the President's request for DOD Research programs.

II. The Nation's Need for Highly Trained Scientists and Engineers

In many fields of science and engineering essential to the nation's security and economic recovery, we face a shortage of Ph.D. engineers and scientists. Fields adversely affected include computer science and many subspecialties of engineering. Talented U.S. undergraduates simply are not pursuing graduate studies in these fields in sufficient numbers to meet our nation's needs. Many students now reject doctoral education for a more promising and highly competitive job market. In that market universities frequently are at a competitive disadvantage in recruiting talented young faculty. As a result, the nation is widely, and correctly, perceived as "eating its own seed corn."

The present situation in our schools of engineering is particularly serious and illuminating. Undergraduate engineering enrollments are soaring toward record heights. The 1980 freshman engineering class nationwide was the largest ever recorded. Universities, however, lack the faculty and the talented graduate student assistants to handle the load efficiently and productively. Classes now are overcrowded. Many severely so. More than 10% of all engineering faculty positions in the United States stand vacant. A recent American Council on Education survey of engineering deans shows that 80% believe the quality of engineering education is deteriorating. As a result more than 20 universities have announced limitations on enrollments rather than allow a further decline in the quality of their instructional programs. Schools of Engineering, however, are not alone. Departments in other specialties of the physical and biosciences are experiencing comparable problems.

The Defense Science Board report gives several indicators of the problem's dimensions:

- Between 1972 and 1980 the number of engineering Ph.D.'s granted declined 27%, all attributable to a decline in awards to U.S. citizens.
- In 1979-80, as a result of the drop in the number of U.S. citizens earning the degree, 46% of all engineering doctorates were awarded to foreign citizens.
- The proportion of full-time foreign graduate students in science and engineering rose from 16% in 1974 to 20% in 1979.
- The foreign share of graduate enrollment in science and engineering is more than doubled the graduate enrollment in all other fields.
- Over 40% of 1979 graduate enrollment in engineering consisted of foreign students.
- Over 30% enrollment in mathematical/computer sciences consisted of foreign students.

- One out of five science and engineering doctorates was awarded to foreign citizens in 1979.
- An estimated 70% of foreign science and engineering doctorate recipients leave the U.S.[2]

The problem here is not the number of foreign students enrolled in our programs. We have an excellent record and a responsibility to provide advanced education to students from other nations. The problem is that too few of the best American students are choosing graduate education over the job market. As a nation we are failing to attract our most able students into research and education careers.

In this connection, and if you will forgive a personal item, I would like to note that as a young research physicist I was fortunate enough to attract research support from the Office of Naval Research in the late 1950s and early 1960s. This funding helped me direct ten graduate students to their advanced degrees in physics and electrical engineering. I cannot imagine a more effective expenditure of public monies.

We are encouraged that the Department of Defense has responded to the requirements of the 1980s. DOD has announced a small (125 awards are planned in FY 1983) targeted program of graduate fellowships in engineering and the sciences to attract the most able U.S. undergraduates to graduate programs in fields critical to our national security and economy. Under this new program, the stipends ($12,000) will be more competitive with the job market. The universities selected by the students also will receive an educational allowance ($8,000) that better recognizes the present high costs of graduate education in the sciences and engineering.

We fully support the Department's proposal. It is an excellent first step. We urge the Committee also to fully support it. As the program is implemented, we hope it will be possible to further strengthen it by providing both portable, merit-based awards to students and an equal number of awards to academic departments within universities active in DOD-supported research. Such fellowships should be allocated in proportion of the amount of DOD research support received. Together a balanced program of portable and departmental fellowships would provide a balanced program, designed to ensure a continuing flow of talented students to all those laboratories that perform DOD-supported research.

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[2] pp. 2.3 - 2.8.

III. Research Instruments and Laboratories

Obsolete research instrumentation and outdated science and engineering laboratories are seriously hampering the efficiency and competitiveness of many federal university research programs, including those that perform DOD-supported research programs. Two studies completed in 1980 and 1981 by the Association of American Universities documented the erosion of research instrumentation and laboratories in our leading universities. A July 1981 report[3] found that universities are able to meet approximately half of their accumulated needs for laboratory renovation, modernization, and replacement and for high-cost specialized research equipment.

For example, in recognition of the seriousness of this problem, the Utah State Legislature has appropriated some

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[3] The Nation's Deteriorating University Research Facilities: A Survey of Recent Expenditures and Projected Needs in Fifteen Universities. Association of American Universities, Washington, D.C., July 1981.

$500,000 to the University of Utah in each of the last three years to fund replacement and upgrading of sophisticated but outmoded research instruments. This is a very significant step, but the annual depreciation of research equipment at my University exceeds $2,500,000. Serious unmet needs for laboratory renewal are also reported by other leading universities in many of the engineering and physical sciences laboratories that now perform, or are candidates to carry out, DOD research programs.

A June 1980 AAU report to NSF states, "It is a telling fact that the equipment being used in top ranked universities has a median age twice that of the instrumentation available to leading industrial research laboratories."[4] Figure 3 from that study shows the striking disparity between the equipment being used in universities and that used in comparable commercial laboratories. The Executive Summary from each report is appended to my statement (Attachments B and C).

In commenting on this report, the recent Defense Science Board report states, "This finding is negated neither by the ability of top researchers to 'find' the equipment they need nor by university efforts to use their equipment more efficiently."[5]

After reviewing the evidence, the Defense Science Board drew the following conclusion.

> "Critical shortages in university equipment and facilities have developed in recent years. The equipment obsolescence and increasing replacement costs have handicapped university efforts to maintain a research and development hardware capability.

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[4] The Scientific Instrumentation Needs of Research Universities, National Science Foundation, June 1980.

[5] The Report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements, pg. 2-10.

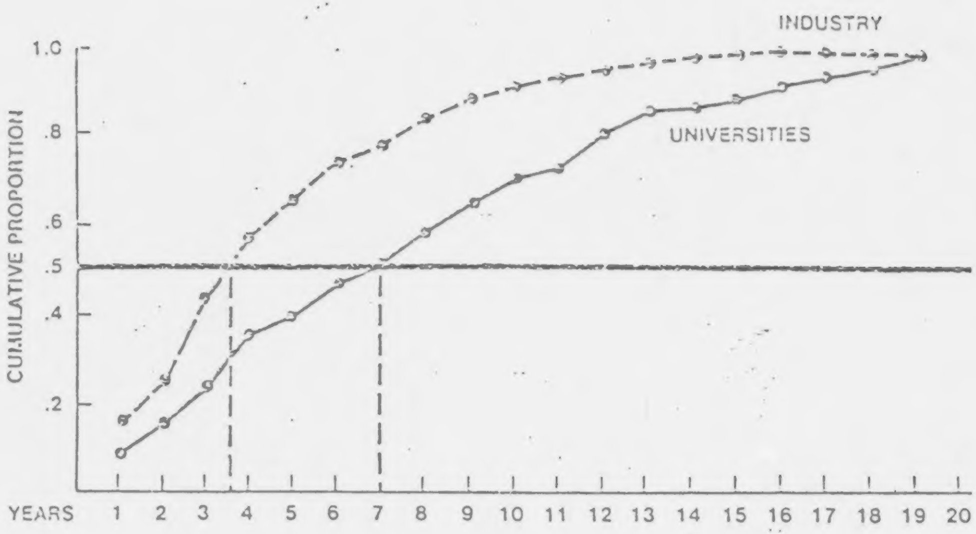

FIGURE 3. *Age of Instrumentation in Universities Twice That In Industry (Proportion of Instrumentation Inventory Purchased Less Than n Years Ago; Data Derived from Table A).*

Source: The Scientific Instrumentation Needs of Research Universities, National Academy of Sciences, June 1980.

> University computing equipment and facilities, labortory equipment (for both research and teaching), test equipment could all be upgraded with a rapid pay-back period. A declining space exploration program, for example, has left university research laboratories with aging equipment and no replacement prospects."[6]

Supported by the DSB report, the Department of Defense in its FY 1983 budget request include a special $30 million research equipment initiative designed to begin the task of upgrading engineering and science laboratories that carry out DOD-funded basic research. The Senate Armed Services Committee, in its report on the FY 1983 DOD authorization quoted above, fully supports the initiative.

Recently three American Nobel Laureates for 1981; Dr. Donald N. Langenberg, Deputy Director of the National Science Foundation, and the Honorable Charles S. Robb, on behalf of the National Governor's Association, addressed the universities' instrumentation problem in testimony before Congressional committees. Their statements, Attachment A, support the conclusion that even in these times of budgetary constraint, key federal research agencies, including the Department of Defense, must take an active leadership role in renewing the laboratories of our nation's research universities.

We congratulate Under Secretary DeLauer and the Department for this initiative. We urge the Committee to fund the Department's $30 million budget request for research instru mentation.

Conclusion

Much of what I have said this morning is relevant to the interests and responsibilities of other Congressional Committees and federal agencies. In fact, last year I gave essentially the same message to the Senate Committee on Labor and Human Resources. Others representing the members of theses associations have addressed these concerns in similar terms before other committees. The message is consistent because universities are a permanent and indispensable reservoir of talent for the nation. University research has contributions to make in many areas important to our national life and welfare. These concerns require and receive government-wide support and attention. By encouraging DOD support for basic research and teaching, you will sustain a capacity that compliments that much more highly focused and mission-oriented work of the Department's own laboratories. Our best insurance against technological surprise, military or economic, is the encouragement of fundamental, in addition to mission directed, research. If our universities have the facilities, the equipment, the stable and open research environment, and -- most important -- the talented young people to make the enterprise work, we need not worry about the ability of the nation's universities to contribute to national security. That will take care of itself.

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[6] Ibid page 5-3

Thank you very much for your kind attention. I will be glad to respond to questions.

Attachment A

AMERICAN NOBEL LAUREATES FOR 1981, Before The House Committee on Science and Technology, February 24, 1982

Dr. Arthur L. Schawlow
Stanford University

"Now it is widely recognized that the research equipment available to many American scientists is really obsolete, and not keeping up with that available in some other advanced countries. For established scientists, this tends to force them to continue repeating variations of their older work, rather than to undertake something really new. But for young scientists, especially at universities, obtaining equipment funds to begin research can be a nearly insuperable obstacle. Some very good young scientists are choosing not to join university faculties, even when positions are available, because they fear that they will not be able to do any research. The universities need to attract such people, for they are the ones who will be, and will educate, the scientists of the future. It is important to note, in these days when the problems of engineering manpower and education are being recognized, that physicists play an important part in new technologies. In 1960, there were no trained laser engineers, and physicists predominated in the development of lasers. Similarly with the sudden growth of genetic engineering, much of the work is being done by people trained as scientists. It is important that the universities continue to be staffed by creative people who are themselves participating in the creation of new knowledge. These are the people who can teach science as a dynamic, growing subject rather than as a body of dusty facts entombed in textbooks."

Dr. Nicholas Bloembergen
Harvard University

"This fine system (of academic research) has come under stress because the rapidly escalating costs of instrumentation and technical support for modern research have encouraged a trend toward larger, and often less flexible, research institutes. The small-scale basic research units in academic institutions in the United States suffer from obsolescent instrumentation and support facilities. These are decidely inferior, on the average, to those found at industrial and governmental laboratories in the United States, and also inferior to those found in academic institutions on the Western European continent. In my opinion it is worthwhile to keep the individual academic research projects competitive by providing special funds for a much-needed upgrading of instrumentation and support facilities in U.S. universities."

Dr. Torsten N. Wiesel
Harvard Medical School

"It is particularly disturbing that the predominance that the United States has enjoyed over the last few decades is seriously threatened. In a period of budgetary restriction, research requires increasingly sophisticated instrumentation, so that the budgetary needs of staying at the forefront of research are accelerating well ahead of inflation. Other countries, including Germany, Switzerland and Japan, show much more willingness to adequately equip their laboratories for basic research. For years the best scientific minds came to the United States because of the opportunities to carry out independent and original research. Now I have noted a number of disturbing instances in which prominent American scientists are moving elsewhere to pursue their research under conditions that are better than those available to them here."

DR. DONALD N. LANGENBERG, Deputy Director, National Science Foundation, Before The House Subcommittee on Science, Research and Technology, March 4, 1982

"There is an emerging consensus in universities, the federal government and private industry that there is a critical and growing need to replace obsolete and worn-out research apparatus and laboratory facilities in the nation's research universities....

If the general assessment of the scope and nature of the problem is a correct one, and we believe that it is, it means that the productivity and efficiency of the nation's academic research enterprise has already declined and will continue to decline. Most of modern science and engineering research is instrument-dependent. Capital investment in advanced instrumentation and facilities is necessary if we are to maintain our national position at the forefront of a wide variety of disciplines and to obtain maximum productivity in the future from our investment in research."

THE HONORABLE CHARLES S. ROBB Before the House Committee on Science and Technology, April 29, 1982

"In the past several months, Virginia's higher education planning agency has surveyed all the states to determine the extent to which research equipment at our colleges and universities is obsolete, in disrepair, or simply unavailable. The results of our survey indicate that we are on the brink of crisis because many of our major institutions no longer have the equipment we need to conduct research on the frontiers of knowledge....

Make no mistake about it. If the "brain drain" from universities to industry is hurting now, the loss of outstanding intellects to teach the next generation will cripple both America's universities and its industries as this century draws to a close....

My fellow Governors and I urge Congress to declare its unequivocal support for the development of advanced technologies, to identify appropriate educational programs and research as a national priority in these times of economic difficulty and international tension, and to provide adequate federal dollars when appropriate. As Governors, we pledge our support of the partnership linking the states, the federal government, and private enterprise. We believe that renewed emphasis upon this partnership will strengthen our nation's reputation for technological innovation and excellence.

Nothing less than the jobs of the next generation and America's economic position in the world are at stake."

Attachment B

THE NATION'S DETERIORATING UNIVERSITY RESEARCH FACILITIES

A Survey of Recent Expenditures and Projected Needs in
Fifteen Universities
July 1981

Association of American Universities

EXECUTIVE SUMMARY

OBJECTIVES OF THE SURVEY

This survey of 15 leading universities had three objectives:

-- In the institutions surveyed, document expenditures for research facilities and major ($100,000 or more) equipment, without regard to source of funds, over the last four years in the following six fields:

- Biological Sciences
- Chemical Sciences
- Earth Sciences
- Engineering
- Physics
- Medical Schools (10)

-- Provide responsible estimates, prepared by those universities, of expenditures for research facilities and major equipment that would be required over the next 3 years to meet the research and training needs of only current faculty.

-- From researchers and department heads, acquire assessments of the major consequences for science, industry, and government if the accumulating facilities needs of their institutions are not addressed.

FINDINGS

In many of the science and engineering departments surveyed, a substantial backlog of research facilities and equipment needs is accumulating. Projected funding needs over the next three years equal almost twice the level of expenditures by universities for their research laboratories and equipment over the past four years. Already, institutions often are unable to provide their basic science and engineering researchers and students with either the modern laboratories or equipment needed to conduct state-of-the-art research and education programs.

The loss of federal contributions to the support of research facilities and the absence of compensatory sources of support has forced many institutions to renovate and repair only those facilities in greatest need. Even this work often is carried out in a necessarily piecemeal fashion which is uneconomical over the long term. Working under such conditions, researchers unavoidably compromise their productivity and future competitiveness.

Relatively few construction projects have been completed in recent years in a majority of the physical sciences and engineering departments surveyed. Many institutions estimate substantial needs for new laboratories, for the expanded modernization and repair of old laboratories and for modern research equipment. Details are provided in the following report and the appendicies. The survey's principal findings are the following:

- In the last four years, for the six fields surveyed, fifteen leading universities together spent $400 million from all sources for facilities and major equipment. Half of those expenditures was for a relatively small number of new construction projects; the remaining half, spread over a larger number of generally less costly funding projects, was for facility modernization, major repair and renovation, and special purpose research equipment.

- In the next three years, the 15 universities estimate they should spend almost twice as much ($765 million) just to provide the necessary research facilities and special research equipment for current faculty only. These estimates are in current dollars and, therefore, do not include the added effects of inflation.

- New construction to replace outmoded facilities accounts for almost 60% of total projected funding requirements across all fields.

- In addition, substantial needs for major research equipment were identified in all six fields. These equipment estimates include only major items costing at least $100,000. As the 1980 AAU report to the National Science Foundation found, most departments also have serious deficiencies of less costly analytical instrumentation and support equipment.

RECOMMENDATIONS

The problems of obsolescence in the nation's university research facilities have been growing for more than a decade. To solve them, a new national investment strategy is needed. That strategy should provide direct, balanced support for university facilities from federal agencies and provide investment incentives designed to involve industry, the states, and the universities in a coordinated effort. The following steps are suggested as starting points:

1. Key Executive agencies should develop a mechanism to periodically assess the condition of university research laboratories and the consequences for the nation of that condition. Such assessments should involve the Office of

Science and Technology Policy, the National Science Foundation, the Department of Defense, the Department of Energy, the Department of Health and Human Services, the Department of Agriculture and the National Aeronautics and Space Administration. The views of industry and the universities also should be solicited.

If the initial review corroborates the assessment of this suvey the following recommendations should be considered:

2. The facilities and equipment program earlier proposed to be undertaken by the National Science Foundation but deferred should be restored as a priority initiative in FY 1983.

3. The Department of Defense, Department of Energy, the National Aeronautics and Space Administration, the Department of Health and Human Services, and the Department of Agriculture should establish research instrumentation and facilities rehabilitation programs targeted on the fields of science and engineering of primary significance to their missions. The National Science Foundation should assist in the development, implementation, and coordination of those activities.

4. Incentives should be provided to encourage industries and the states to join with universities and the federal government in renewing the nation's university research laboratories.

5. Interest costs incurred in the construction, modernization, renovation, and repair of facilities in which federally supported research programs are carried out should be allowable indirect costs under OMB Circular A-21.

Attachment C

THE SCIENTIFIC INSTRUMENTATION NEEDS
OF
RESEARCH UNIVERSITIES

A Report to the National Science Foundation
by the
Association of American Universities

June 1980

EXECUTIVE SUMMARY

OBJECTIVES OF THE STUDY

- assess the current status of scientific instrumentation in major research universities
- identify factors which facilitate or impede its development, acquisition, use, and maintenance
- estimate the future consequences of present funding policies
- recommend appropriate policy changes

METHODOLOGY

- sixteen universities, six national and government laboratories, and nine commercial laboratories were visited; about 80 department heads and over 250 researchers and research administrators were interviewed in the universities; in addition, the views of approximately 60 researchers and research managers were gathered in visits to national, government, and commercial laboratories
- five fields of science and engineering were studied: physics, chemistry, biological sciences, earth sciences, and electrical engineering
- numerical data on instrumentation acquisition, age, and replacement were gathered from 14 universities and four commercial laboratories

THE PROBLEM

Instrumentation is essential for progress in experimental research. Scientific knowledge has advanced rapidly; new instruments, more costly but qualitatively superior to earlier ones, have allowed measurements previously impossible. The rate of change has been great, competition among researchers intense. The capacity of university researchers to work at the frontiers of knowledge has important consequences for the nation's future research productivity and for the training of future generations of scientists and engineers.

The federal government has adopted a variety of funding policies for the support of research instrumentation: the competitive project system, special instrumentation programs, formula grant programs, block-funded centers, federally sponsored research centers, and regional instrumentation centers chief among them. For about 15 years, federal support for basic research has gradually declined; now support levels are further strained by rapid inflation. But inflationary price increases are simply the rising baseline upon which are superimposed the frequently much larger increases resulting from instrumentation advances.

ASSESSMENT

The great diversity of instrumentation needs found among institutions visited precludes simple generalizations. However, problems in the acquisition, use, and maintenance of research instrumentation were found in all of the leading universities visited. The precise configuration of these needs and problems varies widely. The capabilities of institutions and departments to meet them do also.

University researchers face great difficulty in replacing worn-out or obsolete instrumentation and in acquiring new instruments needed for frontier research. A comparison of university instrumentation inventories with those of two leading commercial laboratories reveals that the median age of university equipment is *twice* that of the commercial laboratories' instrumentation. Even the nation's major research universities have not kept pace in meeting instrumentation needs. Researchers heavily dependent upon federal funds have witnessed grant size fall behind escalating research requirements. As a result, many work with inadequate tools that impair the pace of research, force closure of lines of inquiry, strain operations and maintenance budgets, and compromise the advanced education of graduate students.

Start-up funds for new faculty often are shrinking as costs rise. Support equipment is needed to test, calibrate, and augment primary instruments. Often it is especially difficult to fund. Funding for operation and maintenance costs is increasingly difficult to obtain. As a result, faculty and students sacrifice research time to these routine tasks.

Many research facilities are in need of renovation or replacement: federal funding for these purposes has decreased, however, and universities lack the funds to respond. Signs that aging facilities now impede research were found in many laboratories and support facilities.

Local university needs vary widely, reflecting the unique circumstances under which each institution operates and the great diversity between and even within the five fields studied. Present funding policies do not provide sufficient flexibility to deal with such local circumstances.

When compared with government and commercial laboratories visited, most university laboratories fare poorly. The best-equipped industrial laboratories surpass almost all university laboratories visited. One university researcher captured the sense of disparity and observed, "the ivory towers are now in industry." The director of one leading industrial research laboratory described the struggle of university researchers as he has observed them as "pathetic." When asked to contrast their laboratories with foreign laboratories, a number of university researchers stated that many, most notably those in Japan and West Germany, are now superior.

CONCLUSION

The quality of research instrumentation in major university laboratories has seriously eroded. Not all, but many researchers in the nation's best-funded universities are struggling to work effectively with obsolete tools. The equipment being used in the top-ranked universities has a median age twice that of the instrumentation available to leading industrial research laboratories.

Three *causes* are identified:

- a relative decrease in instrumentation support
- inflexibility within the project system
- insufficient support for maintenance

Three major *consequences* are:

- diminished research productivity
- reduced training capacity
- decline in international competitive status

RECOMMENDATIONS

Federal policy for the support of research instrumentation should provide for a basic three-part funding strategy:

- strengthen instrumentation funding in the project system
- expand special instrumentation programs
- create in the National Science Foundation a new, supplemental formula grant program to provide needed flexibility to meet diverse institutional needs

FUTURE STUDIES

Five studies are recommended: 1) a thorough analysis of foreign research funding policies and programs and their implications for the competitive stature of American science should be undertaken; 2) a study of cooperative research arrangements between industries and universities and the factors—including federal policies—that encourage and discourage them is needed; 3) the planned assessment of regional instrumentation centers should include consideration of the concerns documented in this report; 4) universities should assess current instrumentation policies and develop mechanisms and incentives designed to promote effective sharing of instrumentation; 5) an assessment of the costs and benefits of federally-mandated equipment inventory and reporting systems should be undertaken.

DECLINE IN U.S. R&D

Senator GARN. Thank you, Dr. Brophy. We appreciate your willingness to testify.

I might just add that I am well aware of the problem in the HUD-Independent Agencies Subcommittee, which I chair, on Appropriations. One of the independent agencies is the National Science Foundation. We just completed testimony on all of our hearings the week before last and we talked a great deal about research and development in general, not just defense. It is an area that I think has really been going downhill as far as support for a considerable amount time.

We look, as you mentioned, at both economic and defense policy. We have always been able to brag, well, we can do better than anybody else because of our technology. We can overcome vast quantitative advantages on the other side. I think that is true to a certain point, but when we allow our technology to diminish because of a lack of trained people and the foreign students we are helping, I don't think that people realize the burden that that places on the defense of this country as well as the economic trade balance.

I have been very active in high technology trade with the Soviet Union and the Communist bloc, and that seems to be better known all the time, the Almo pipeline, and the Kume River Truck Factory, ball bearings and all of that sort of thing. What has been overlooked is the tremendous number of Russian students we are training. I don't care if we want to have American ballet classes for them or all sorts of other things, but I fail to understand when we are not adequately training enough of our own scientists and we are taking up space in our universities with Russians who go back and learn our technology and our skills and then use it against us and that increase our defense budget the more we aid them technologically.

I couldn't agree with you more, the research and development area is a highly important one, not only in defense but in economic activities as well.

As far as the dollar drain on the country, it is probably even much larger in the economic area than it is as far as the defense area.

We appreciate your testimony and your willingness to come today.

Thank you very much.

Mr. BROPHY. Thank you, Senator.

COUNCIL FOR A LIVABLE WORLD

STATEMENT OF JOHN ISAACS, LEGISLATIVE DIRECTOR, COUNCIL FOR A LIVABLE WORLD

STRATEGIC

Senator RUDMAN. I call on Mr. John Isaacs representing the Council for a Livable World.

Mr. Isaacs, if you have a prepared statement, it will be incorporated into the record.

Mr. ISAACS. Thank you very much, Mr. Chairman, Senator Rudman.

I very much appreciate the opportunity to testify on behalf of the Council for a Livable World as a part of your hearings on the fiscal 1983 budget. I have a full written statement which I would appreciate placing in the record and I would like to make some additional oral comments.

I intend to concentrate today on the strategic weapons portion of the $258 billion budget. Before making some specific comments, however, I wish to commend Chairman Stevens and this subcommittee for holding open markups on the defense appropriations bills last year.

In my 10 years of covering defense authorization and defense appropriations bills, this was my first opportunity ever to witness a markup of a defense bill. They are almost always held behind closed doors. Needless to say, it was an eye-opening experience.

As this subcommittee considers the fiscal year 1983 defense request, you are, I am sure, very aware of the prevailing reality in Congress today, namely, whatever your own preferences or predelictions, Congress is going to make some reductions in the fiscal year 1983 defense budget. Whether this conventional wisdom is the most sensible response to the tremendous budget deficits facing this country today, I will not get into. But there have been enough predictions from conservatives and from liberals—witness what the Budget Committees have proposed—that it is clear that there will be cuts made. How much remains in doubt, as the Budget Committee action in the House, of course, remains very much in doubt.

When this subcommittee gets to markup you have two basic choices. Either you can take the usual course of action and make small trims here and there, stretch out this or that procurement program, cut back operations and maintenance here or there, or you can make some priority choices in this budget, something that I believe this administration has failed to do.

I particularly recommend you look at some of the big-ticket items in this strategic budget as adding the least to American national security interests.

I fully understand that cutting $4.5 billion from the MX missile program or the $4.8 billion from the B-1B program will not produce significantly lower outlays in the next fiscal year and consequently will not make a large dent in the overall fiscal 1983 budget deficit. But these two cuts alone will produce significant budget authority savings that will have to be made at some point in the process this year. At the same time, terminating these two programs will produce significant outlay savings in the future at a time you will still be striving to produce a declining Federal deficit.

STRATEGIC PROGRAM BUDGET

I understand the strategic budget totals "only" $23.1 billion of the entire Pentagon budget. But in considering the relative need in the budget and where our defense priorities should be placed, I believe that the strategic program is the place to begin.

One of those priority choices can be found in examining the strategic air programs. The administration is of course proceeding with not one, not two, but three separate programs to add to the strategic air leg: The air-launched cruise missile program, the B-1B, and the Stealth bomber.

For the administration to move forward with three major strategic air programs at the same time, in the midst of the budget crunch, is the height of fiscal and military folly. The B-1B is a particularly wasteful and ineffective weapon with a limited strategic usefulness, available at a high cost.

The administration's difficulty in justifying this high cost last year can be seen by its constantly changing of dollar estimates, the date of availability of the Stealth bomber, and the date of the end of the B-1B bomber's penetrating ability into Soviet airspace.

STEALTH BOMBER PRODUCTION

I might note that in the New York Times over the weekend, there is a new estimate from unnamed sources suggesting that the Stealth bomber could be produced as early as 1987, and not 1991 as the Air Force has suggested.

Senator RUDMAN. I might tell you, Mr. Isaacs, we can also produce sources that will tell you it won't be ready then and it might not be ready until 1995, and when it is ready it might not do what it is supposed to do. So there are two sides to that.

Mr. ISAACS. There are probably many sides to that, you are right.

A second tough choice is faced with the MX missile program. Much of this committee have been staunch supporters of the MX missile program for many years. Yet the MX program, as it is now outlined by the administration's request in this budget, is certainly not satisfactory to you any more than it is to the longtime critics of the program.

The Reagan administration to be sure deserves a measure of credit for disregarding Jimmy Carter's sprawling 4,600 shelter plan and for reducing the number of missiles to be deployed. I know that a number of members of this committee, including Chairman Stevens and Senator Garn, were early skeptics of the Carter plan.

Having gone halfway, however, the President was not able to go the full distance and to admit that the justification for proceeding with the MX missile is exceedingly weak.

Rather than kill the program in its entirety, the President insists on spending $4.5 billion on the MX program this year while he continues to explore additional options for land-based missiles. On the one chart there I have outlined what I think is a roughly complete list of basing option. Thirty-three separate options have been proposed, studied, and rejected as lacking, and now the administration is trying for a 34th, the Dense Pack scheme, which is being examined right now. I might add that the administration said last year in October they were down to three options and all three options now seem to have been by and large rejected.

Since the MX program was first announced in 1979 the 4,600 shelters have been cut back to maybe 100 if they go with a temporary deployment scheme; the 200 deployed missiles have been reduced to 100; mobile deployment has been transformed into a static basing; the MX is now likely to replace Minuteman missiles rather than Titans, in October they announced the superhardening of silos and then they abandoned that, and then of course, as I said, the three options were announced and then abandoned.

What little remains of the MX program should be eliminated. If this committee supported deployment of a mobile missile system due to the vulnerability of our land-based missiles, a dubious, highly theoretical vulnerability at that, then placing 40 or 100 missiles in fixed silos seems to make even less sense.

I am aware that the Senate Armed Services Committee has eliminated from the budget a fair amount of the temporary deployment money, but it is not clear if that decision will stick considering what the Armed Services has done.

I might add that the revised MX deployment, at least the temporary deployment, and even the Dense Pack, seem to violate the original mandate expressed by Congress in the fiscal 1977 Defense Department authorization bill reported in 1976.

At that time Congress said:

> The rationale behind the deployment of a new missile system is to provide a land-based survivable strategic force. The development of an alternative basing mode as opposed to a fixed or silo base mode is the key element in insuring the survivable force. The conferees are in agreement that providing a survivable system should not be constrained for silo basing and that none of the program funds should be expended in fixed or silo basing for the MX.

Yet fixed silos certainly are the temporary deployment proposed by the administration and may be the longer term deployment as well.

A third failure two make hard choices can be seen by examining the major problems facing the country today. A short list of some of the major problens is included in the chart that faces you: how to respond to the Polish military crackdown; how to counter the Soviet invasion of Afghanistan; how to resolve the El Salvador imbroglio; how to bring peace in the Middle East; how to restore NATO unity; how to stimulate the faltering economy; how to lessen our dependence on foreign energy sources; and how to improve the competiveness of U.S. industry abroad.

In all of those problems neither the MX nor the B-1 seems to meet the problems. In fact, I think one could argue that those programs divert resources that might be better spent to meet those challenges.

If this committee does take action this year and does kill the MX, the 5-year savings from killing the MX will be $23.9 billion in budget authority and $19.8 billion in outlays. The total 5-year savings from killing the B-1B will be $27.2 billion in budget authority and $23.0 billion in outlays. That is a lot of money that could do a lot of things, including diminish the deficit.

I do want to state, as I did in the beginning of my prepared text, that the Council for a Livable World recognizes the fact that the Soviet Union has continued to build thousands of nuclear weapons far beyond any rational security needs.

There is no doubt that the Soviet Union has engaged in a tremendous military buildup over the past decade that has produced a formidable military machine and has caught up with and even surpassed the United States in various static measurements of the nuclear balance.

But the Reagan administration, as judged by its budget presentations in some recent statements, would have you believe that we are way behind the Soviet Union and that we have been standing still over the past decade in the development of strategic arms.

That clearly leaves the implication that Presidents Nixon, Ford, and of course Carter, to say nothing of Defense Secretaries Laird, Rumsfeld, Schlesinger, Richardson, and Brown, or this committee for that matter, has been derelict in its duties to protect our national security.

Nothing could be further from the truth. We have been proceeding with many strategic programs over the past decade and are still moving ahead with a wide variety of programs.

In summary, what I have to say here today is that the Defense Appropriations Subcommittee should be willing to make those hard decisions and, in my judgment, should in particular aim at the MX program for termination, the B-1B and also the chemical weapons program, which I discuss in my prepared remarks. If you do not act this year, you will be forced to deal with a budgetary impact for years to come. Moreover, you know that the Soviet Union will respond in kind.

The end result will be a diminishing of our national security and the bringing of the world closer to nuclear destruction. If nothing else, with the higher level of arms after a period of years, we will risk nuclear war due to miscalculation or accident.

The only alternative that promises some hope, in our judgment, is a freeze on the nuclear arms race to be followed by reductions in the levels of the current stockpiles. Clearly the negotiating process that could lead to a freeze is an extremely difficult one and fraught with uncertainties and hard decisions. But we have no other alternative if we want to spare our country and our civilization the horrors of nuclear war.

Thank you.

[The prepared statement of Mr. Isaacs follows:]

PREPARED STATEMENT OF JOHN D. ISAACS

LEGISLATIVE DIRECTOR

COUNCIL FOR A LIVABLE WORLD

I appreciate very much the opportunity to testify on behalf of the Council for a Livable World on the Fiscal Year 1983 Department of Defense budget. In my testimony today, I intend to concentrate on the strategic weapons portion of the $258 billion budget.

The Council for a Livable World was founded in 1962 by the eminent nuclear physicist Leo Szilard to combat the menace of nuclear war and to strengthen national security through rational arms control. The Chairman of the Council is George Kistiakowsky, President Eisenhower's Science Advisor, and the President is Jerome Grossman of Massachusetts. I am the Council's Legislative Director as well as Director of the Washington office.

The Council for a Livable World views the Reagan Administration's strategic modernization program as, at best, a costly, wasteful and ineffective means to meet this country's national security needs; at worst, the Administration's policy is fraught with danger to this country and risks pushing the United States and the rest of the world ever closer to a nuclear Armageddon.

One major flaw with the Administration's strategic modernization programs is that the President and his national security team remain entangled in senseless numbers excercises comparing U.S. nuclear forces to those of the Soviet Union.

A second flaw is that the Administration refuses to confront the difficult issues in deciding among various strategic weapons options and in evaluating strategic versus conventional weapons programs.

A third flaw is that the Administration continues to move toward the production of dangerous weapons programs that threaten the nuclear stability existing today.

And fourth and most important, the Reagan Adminstration's policy of arms control negotiations, while showing considerable progress in 18 months, still appears geared more to scoring points than to producing serious agreement.

THE SOVIET THREAT AND THE NUMBERS GAMES

Let me state at the outset that the Council for a Livable World recognizes the fact that the Soviet Union has continued to construct thousands of nuclear weapons far beyond any rational security needs. There is no doubt that the Soviet Union has engaged in a tremendous military buildup over the past decade that has produced a formidable military machine and has caught up with an even surpassed the U.S. in various static measurements of the nuclear balance.

The Soviet Union could destroy us in a matter of hours -- just as we could destroy them. This mutual threat is an inevitable part of the hostage relationship which has existed for many years now between the superpowers. After all, The United States has about 9,000 strategic nuclear warheads today -- and about 26,000 of all forms of nuclear weapons. The Soviet Union has about 7,000 of their own strategic weapons, and a total of perhaps 20,000 nuclear weapons in all (See Table 1 for a listing of strategic weapons).

TABLE 1

Strategic forces of the United States and the Soviet Union

UNITED STATES

Land-based Intercontinental Ballistic Missiles

The United States now has deployed 1,054 ICBMs with a total of 2,154 warheads, including:

450 Minuteman II missiles—each with 1 warhead for a total of 450 warheads;
550 Minuteman III missiles—each with 3 warheads for a total of 1,650 warheads;
54 Titan missiles (although 2 are currently inactive)—each with 1 warhead for a total of 54 warheads.

Future: The United States plans to build and deploy by 1989 200 MX missiles, each with 10 warheads for a total of 2,000 warheads.

Sea-based Ballistic Missiles

The United States as of January 1981 had a total of 36 submarines in the inventory with a total of 576 missiles with a total of 4,816 warheads, including:

5 Polaris submarines—each with 16 A-3 missiles, each missile with 3 warheads, for a total of 240 warheads
(These 5 submarines are slated for deactivation as strategic submarines);
19 Poseidon submarines—each with 16 Poseidon missiles, each missile with about 10 warheads, for a total of about 3,040 warheads;
6 Poseidon submarines—each with 16 Trident C-4 missiles, each missile with about 8 warheads, for a total of about 768 warheds;
6 Other Poseidon submarines are in the process of converting from Poseidon missiles to Trident missiles, which means an additional 768 warheads.

Future: Under construction is a program to build at least 15 Trident submarines—each with 24 missiles, each missile with 8 to 10 warheads.

Strategic Bombers

The United States currently has deployed 412 long-range bombers with a total of about 1,900 nuclear weapons, including:

347 B-52 bombers—each with an average of a little over 5 weapons per plane, for a total of about 1,640;
65 FB-111 bombers—each with an average total of about 4 nuclear weapons, for a total of about 260;

Future: The United States is in the process of equipping 172 B-52 bombers with 20 cruise missiles each. In addition, the U.S. Air Force intends to build a follow-on manned bomber to replace the B-52s, either a version of the B-1 bomber and/or a newer "stealth" bomber.

In sum: In terms of overall strategic systems and weapons, the U.S. strategic forces are comprised of about 1,630 missiles and 412 long-range bombers with a total of about 9,000 nuclear warheads and weapons.

SOVIET UNION

Land-based Intercontinental Ballistic Missiles

The Soviet Union has deployed 1,398 ICBMs, with roughly 5,000 warheads, including:

580 SS-11s—with 1 warhead per missile;
60 SS-13s—with 1 warhead per missile;
About 150 SS-17s—most of which have 4 warheads and some 1 warhead;
308 SS-18s—most with 8 to 10 warheads and some with 1 warhead;
About 300 SS-19s—most with 6 warheads and some with 1 warhead.

Sea-based Missiles

The Soviet Union has about 62 submarines in inventory with a total of 950 missiles and under 2,000 warheads on a variety of submarines.

Strategic Bombers

The Soviet Union currently has about 149 long-range bombers, including:

49 Bison bombers (soon to be phased out);
100 Bear bombers.

In sum: Estimations of the Soviet Union's strategic forces are not as exact as numbers of American forces. Their forces are roughly comprised of about 2,350 missiles and 150 long-range bombers with a total of about 7,000 nuclear warheads and weapons.

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The Reagan Administration remains enmeshed in a number's game, using a supposed imbalance of forces as a major rationale for new strategic weapons. Defense Secretary Caspar Weinberger's Fiscal 1983 Posture Statement to Congress stated:

> The broader picture of what has been happening to the nuclear balance becomes clearer as we look at a wide variety of measurements of the U.S.-Soviet nuclear relationship. No single measure of combination of these adequately describes the balance; however, when taken together we see a long downward trend in the U.S. position since the mid 1960's.
> Weinberger Annual Report to Congress, p. II-10

President Reagan went even further recently in his March 31, 1982 press conference: "The truth of the matter is that on balance the Soviet Union does have a definite margin of superiority."

The Reagan Administration would have us believe that we are way behind the Soviet Union and that we have been standing still over the past decade in the development of strategic arms. The Administration clearly leaves the implication that Presidents Nixon, Ford and of course Carter -- to say nothing of Defense Secretaries such as Laird, Rumsfeld, Schlesinger, Richardson, and Brown -- have been derelict in their duties to protect our national security.

Has the United States been standing still in the nuclear arms race? An examination of a list of strategic arms programs well underway before the Reagan Administration took office belies that notion:

1. Between 1969 and 1980 the U.S. strategic force grew from 3,950 warheads and bombs to about 9,000.
2. Between 1972 and 1979, the U.S. deployed 340 ICBMs and over 300 SLBMs, in addition to 1,000 SRAMS for our heavy bombers.
3. The U.S. engaged in a hardening program for our Minuteman force to increase the average blast resistance of our silos from 300 to 2,000 pounds-per-square inch.
4. We began building and deploying Trident I (C-4) missiles with a range of 4,000 nautical miles compared to 2,600 nm for the Poseidon missiles and with greater yield and accuracy.
5. We have been building the new Trident submarines since 1974, with an intention of building 15-20 in total.
6. The U.S. began a program to deploy over 3,000 air launched cruise missiles.
7. We continued research into a longer-range, higher yield Trident II missile.
8. We spent hundreds of millions of dollars on extensive improvements to our B-52 bomber force to improve navigational accuracy, system reliability and the bomber's own defenses.
9. The U.S. began deploying the Mark 12-A warhead on 300 Minuteman III missiles, doubling the explosive yield of each warhead from 170 to 335 kilotons, and improving the kill probability against Soviet missile silos.
10. The U.S. began installing the improved NS-20 guidance system to increase the accuracy of the 550 Minuteman III missiles.
11. The U.S. made major improvements in the strategic command, control and communications network to allow for rapid retargeting of missiles in 25 minutes for each missile and 10 hours to retarget the entire Minuteman force.

Despite the substantial strategic programs of the past decade, the Reagan Administration last October announced a significant expansion of our strategic forces (A summary of the strategic package prepared by the Council is listed in Table 2).

TABLE 2

A BRIEF SUMMARY OF THE REAGAN ADMINISTRATION'S STRATEGIC WEAPONS PACKAGE

TOTAL COST OF THE STRATEGIC PACKAGE: $180 billion over 6 years in FY 1982 dollars, or $222 billion using the Reagan inflation figures. FY 1982 cost: $21.5 billion

AIR LEG OF THE STRATEGIC PACKAGE: $63 billion over 6 years to improve and operate the bomber force (in FY 1982 dollars)

1. B-1 bomber: 100 bombers to be built, initial operating capability in 1986 or 1987, new designation of B-1B, production scheduled to be completed in 1988, unrefueled range of 6,000 miles, refueled range of 9,000 miles, $22 billion cost in FY 1982 dollars or $28 billion using the Reagan inflation rates, FY 1982 request of $2.4 billion, will be able to penetrate Soviet air space until 1990 according to Weinberger.
2. Advanced Technology Bomber (ATB) or Stealth: Follow-on bomber to B-1, first deployment variously estimated for 1989 or 1990's, Northrop has contract and expects first test flight in 1984, cost estimated at $30-$40 billion.
3. Air launched cruise missiles: The U.S. is already in the process of deploying over 3,000 ALCM, including 20 each on 151 B-52 G&H bombers, plus additional ALCM on the B-1B bomber. Total program cost for the missiles is $5 billion plus $7-$8 billion for installation.
4. KC-135 aerial tankers: will be outfitted with new engines to increase the airborne refueling capabilities.
5. B-52D's: Early retirement of B-52D bombers.

SEA LEG OF THE STRATEGIC PACKAGE: $42 billion over 6 years to strengthen and operate the sea-based portion of the triad

1. Trident ballistic missile submarine: Continue building these submarines at the rate of 1 per year (down from 1½ per year) at least through 1987, 9 submarines authorized to date, uncertain final number although Navy would like at least 20, money for 1 Trident was cut from FY 1982 by Congress and by Administration, total program cost of Trident program over $30 billion or about $2 billion per sub, first Trident (the Ohio) has now been delivered to the Navy 2½ years late.
2. Trident I or C-4 missile: New missile to go into Trident submarine (24 per sub) and into 12 Poseidon subs, backfit of Trident I into Poseidon completed in 7 subs and will finish remaining 5 by September 1982.
3. Trident II or D-5 missile: Follow-on missile to Trident I, scheduled for deployment by FY 1989, will be larger so can carry more or larger warheads than Trident I and be more accurate, although with no greater range, will give submarines first-strike potential for first time.
4. Nuclear armed sea-launched cruise missiles: Hundreds of these Tomahawk cruise missiles will be added to attack subs, 12 cruise missiles per sub, deployment beginning in 1984.

LAND LEG OF THE STRATEGIC PACKAGE: $34 billion over 6 years to improve and operate land-based ICBM force

1. MX Missile: Current plan is to build about 200 MX missiles but to deploy only 100, the 4,600 shelter scheme in Nevada and Utah has been dropped, a first group of 18-50 missiles will be placed in existing Titan and/or Minuteman silos, cost of building missiles placed at $13.8 billion in constant 1982 dollars plus up to $7 billion for basing the first group of missiles, FY 1982 request of $1.9 billion, by 1984 make a decision on the basing of the rest of the missiles among three options: airborne missiles, deep underground missiles and/or ballistic missile defense, first group of missiles operational in 1986, second group unknown operational date.
2. Hardening silos: The Titan or Minuteman silos to receive the first group of MX missiles would be hardened to withstand up to 5,000 pounds per square inch (P.S.I.) as opposed to an average 2,000 p.s.i. for Minuteman missile silos.
3. Deactivate Titan missiles: All Titan missiles, which have the largest warheads in our missile inventory, will be deactivate as soon as possible.

COMMAND, CONTROL AND COMMUNICATIONS (C^3): $18 billion over 6 years to improve and operate C^3, including $2.1 billion in FY 1982

1. Deploy mobile ground terminals for processing data from warning satellites
2. Improve survivability of our satellites
3. Improve warning satellites and ground-based radars to give better estimates of Soviet missile attack
4. Build additional PAVE PAWS surveillance radars for detection of submarines to southeast and southwest of U.S.
5. Deploy E-4B airborne command posts to serve as National Command Authority
6. Harden EC-135 airborne command posts used by military commanders in the field against nuclear effects and upgrade communications
7. Install very low frequency/low frequency communications receivers on strategic bombers to receive orders
8. Upgrade communications to deployed submarines
9. Develop new satellite communications system using extremely high frequency channels

STRATEGIC DEFENSE: $23 billion over 6 years on strategic defense

1. Upgrade North American air surveillance network using a combination of new over-the-horizon Backscatter (OTH-B) radars and other improved radars
2. Replace 5 squadrons of F-106 interceptors with F-15s.
3. Add 6 additional AWACS for North American air defense to be deployed in 1986 or 1987
4. Pursue operational anti-satellite system
5. Expand ballistic missile defense (BMD) research and development: $52 million added for FY 1982 to bring total to about $500 million
6. Expand civil defense
7. Develop technologies for space-based missile defense

What will this tremendous $222 billion strategic program accomplish? It will add thousands of new warheads to our arsenal. We may catch up and surpass the Soviets in some statistical measurements. We will not, however, be any more secure. In fact, if we continue with all these programs, we are likely to be armed at a much higher level -- as will, no doubt the Soviets-- with a lessening of security by undermining nuclear stability. We will be able to destroy the Soviet Union even more times than before. And all of this to achieve a balance that has no rational basis.

ADMINISTRATION'S REFUSAL TO CONFRONT DIFFICULT ISSUES AND MAKE HARD CHOICES

The previous sections' enumeration of the planned nuclear weapons buildup points up the second major flaw in the Administration's program: namely, its unwillingness or inability to confront the hard choices that should be made to shape our defenses in the 1980's. This unwillingness to make choices is most glaring in strategic air weapons. The Administration is determined to procede with not one, not two, but three separate programs to add new weapons to our strategic air leg:

1. The air launched cruise missile program
2. The B-1B bomber
3. The Stealth Advanced Technology bomber

The cruise missile construction plus installation is estimated to cost $12-$13 billion; the B-1B program was then estimated at $22 billion in FY1982 dollars but certainly will be much higher; and the Stealth bomber will probably have a cost in the range of $30-$40 billion.

For the Administration to proceed with three major strategic air programs simultaneously is the height of fiscal and military folly. The B-1B is a particularly wasteful and ineffective weapon, with a limited strategic usefulness, available at a high cost. The Administration's difficulty in justifying this huge purchase last year can be seen by its constant changing of cost estimates, the date of availability of the Stealth bomber, and the end of the B-1B's penetrating ability into Soviet airspace.

A second glaring example of refusing to make the hard choice is the MX missile program. The Reagan Administration, to be sure, deserves a measure of credit for discarding Jimmy Carter's sprawling 4,600 shelter plan and for reducing the number of missiles to be deployed. When he rejected the Carter deployment plan, President Reagan candidly stated:

> We have concluded that these basing schemes would be just as vulnerable as the existing minuteman silos. The operative factor here is this: No matter how many shelters we might build, the Soviets can build more missiles, more quickly, and just as cheaply. (The President's official announcement of the strategic weapons package, October 2, 1981)

Having gone half way, however, the President was not able to go the full distance and to admit that the justification for proceeding with the remaining MX missile plan was exceedingly weak. Rather than kill the program in its entirety, the President insists on spending $4.5 billion on the MX program this year while he continues to explore additional options -- now Dense Pack -- for the land-based missile despite the fact that some 30 options have already been studied and rejected over the past decade. The difficult decision honestly made would have been to accept the logic of his own rhetoric and to scrap the MX missile program altogether.

Instead, we now have a MX missile which is an orphan without a home. The MX program, first announced in 1979, now looks like this:

1. The 4,600 shelters have been cut back to perhaps 100.

2. The 200 deployed missiles have been reduced to 100.

3. The mobile deployment has been transformed into a static basing.

4. The MX will now replace some Minuteman missiles rather than Titans.

5. The superhardening of silos was announced and then unannounced.

6. Three new options were announced last year and now all three appear to have been abandoned.

What little remains should be eliminated. If this Committee supported deployment of a mobile missile system due to the vulnerability of our land-based missiles -- a dubious, highly theoretical vulnerability -- then placing 40 or 100 missiles in fixed silos makes even less sense. While the Senate Armed Services Committee eliminated the temporary deployment money, it is not clear if that decision will stick in conference.

Moreover, the revised MX deployment violates the original mandate expressed by Congress in the Conference report on the FY 1977 Defense Department Authorization bill reported June 28, 1976:

> The rationale behind the development of a new missile system (MX) is to provide a land based survivable strategic force. The development of an alternate basing mode as opposed to a fixed or silo based mode is the key element in insuring this survivable force. The conferees are in agreement that providing a survivable system should not be constrained for silo basing; that none of this programs' funds shall be expended in fixed or silo basing for MX."

Yet now we have come to a point where the temporary system now being considered was specifically rejected by Congress six years ago. It is also a system that Air Force Chief of Staff Lew Allen commented on October 29, 1981: "It does not guarantee us survivability."

A third failure to make hard choices can be seen by examining the major problems that confront the U.S. today. A short list of these problems include:

- How to decrease the threat of nuclear war;
- How to respond to the Polish military crackdown;
- How to counter the Soviet invasion of Afghanistan;
- How to resolve the El Salvador imbroglio;
- How to bring peace to the Middle East;
- How to restore NATO unity
- How to stimulate the faltering economy without setting off a new round of inflation;
- How to lessen our dependence on foreign energy sources; and
- How to improve the competitiveness of U.S. industry abroad.

Building an MX or a B-1B does not respond to any of these problems. In fact, it diverts resources that might better be spent to meet these challenges.

Total 5 year savings from killing the MX: $23.9 billion in budget authority
$19.8 billion in outlays
Total 5 year savings from killing the B-1B: $27.2 billion in budget authority
$23.0 billion in outlays

At a minimum, additional resources spent on conventional forces rather than strategic forces at least begin to meet some of these challenges, programs such as: ensuring that present forces are sufficiently equipped, improving personnel retention, easing skilled personnel shortages, improving the ease of maintaining existing weapons, bolstering the supply of spare parts, ensuring the supply of adequate ammunition for training purposes and for fighting, and increasing training time.

While additional money is slated for Operations and Maintenance in the FY 1983 budget, the Council believes that much more emphasis must be placed in these areas rather than on strategic weapons. We cannot afford -- and never could afford -- to splurge on all components of our forces simultaneously We must make the hard assessments on which needs are the most pressing.

ADMINISTRATION DECISION TO PRODUCE DANGEROUS AND DESTABILIZING WEAPONS

A third critical flaw in the Reagan strategic program is the continued pursuit of a number of weapons programs that do more to threaten than to bolster our national security.

The MX, extensively discussed already, is one important example of this deficiency. The revised MX program would produce and deploy at least 40 missiles in silos that are every bit as vulnerable as our present Minuteman force -- if one accepts the fact that land-based silos are vulnerable to Soviet attack.

Whatever the vulnerability of the MX missile, each of its 10 warheads will have much greater capacity to target the Soviet land-based force. After 1986, we will have deployed missiles that our leaders perceive vulnerable to attack while the Soviet leaders are likely to feel that their land-based missiles are vulnerable to attack also. The Soviets will view the revised MX program as posing an increased threat to their missile force. Rather than produce a more stable nuclear balance, we will be further undermining the nuclear balance.

A second dangerous and destabilizing program is the proposed sea-launched cruise missile system (SLCM). The Administration wants to deploy several hundred nuclear armed sea-launched cruise missiles on our attack submarines beginning in 1984. That these missiles are only a minor addition to our strategic forces is tacitly admitted by Secretary Weinberger when he labels them no more than a "strategic reserve." (Posture Statement, p.III-59)

To obtain this so-called strategic reserve, we will get new missiles with a silo-busting capacity. Moreover, these cruise missiles can be built with both a conventional or a nuclear warhead, making verification of cruise missiles extremely difficult in any future arms control agreement.

A third potentially dangerous weapons program is the Trident II missile. If this new missile were only designed to increase the range of sea-based strategic forces, and thereby increase the operating room for our submarines, we would clearly be enhancing our deterrent force's survivability. However, the increased range appears to have been downgraded in favor of greater accuracy and payload. The Trident II thus becomes a new first-strike weapon.

CHEMICAL WEAPONS

Before moving on to a discussion of the Administration's arms control effort, I wish to highlight one of the smaller programs in this year's budget, although one certain to grow to the multi-billion level if allowed to continue.

There is a total FY 1983 request of $705 million for chemical weapons work, offensive and defensive, research, operations and maintenance as well as procurement (plus a small military construction component). I would urge the Committee to delete $54 million of that larger amount, the money that would enable the U.S. to resume production of lethal nerve gas weapons after a moratorium of 13 years initiated by President Nixon.

The Senate has fought over this issue once this year, and the Administration prevailed by a narrow margin. Under the leadership of the distinguished Chairman of the full Committee, Senator Hatfield, the issue will most certainly be taken up once again.

The binary weapons program is another example of a program taken off the shelf by an Administration unwilling to distinguish between important and unimportant programs. There is little military utility to these chemical weapons; there is no need to build new weapons to add to our present stockpile; there are more useful military investments in other fields, or in chemical defensive work; and the deployment will certainly further undermine NATO unity.

The $54 million involved is only a tiny portion of the overall Pentagon request, but the program will have a larger future budget impact and grave political consequences beyond that $54 million. I urge this deletion.

A DEFICIENT ARMS CONTROL EFFORT

President Reagan has certainly moved a long distance on his nuclear arms control position in the last 18 months. Early in his term, he or his spokespersons were calling the Soviets liars and cheats not to be trusted and loosely talking of nuclear warning shots and nuclear war in Europe.

As a consequence, the Administration has generated a massive movement in this country and abroad aimed at freezing and then reversing the nuclear arms race.

President Reagan has now responded to the political pressure by abandoning his bellicose rhetoric; by announcing that arms control is indeed a priority of this Administration; by finally coming to an internal agreement on an arms control position; by agreeing to abide by SALT I and SALT II limits as long as the Soviets do; and by announcing the beginning of START talks in Geneva June 29.

These changes of position certainly are welcome. This degree of flexibility in the face of a nationwide freeze movement indicates that the President will modify policy if the pressure is intense. Yet whether these modifications are merely rhetorical adjustments aimed at deflating the freeze movement or are designed to produce a serious arms control agreement remains seriously in doubt. Witness these uncertain signals:

1. While the President now talks arms control, it is clear that he and the Pentagon are most interested in a nuclear weapons build-up, including the MX, the B-1B, Trident submarines and Trident II missiles, Pershing IIs and Ground Launched Cruise Missiles for Europe, and the rest. The Pentagon's recently revealed plans for a protracted nuclear war are only the most current example of the decision-making framework for the Administration.

2. The President has advanced arms control proposals which are aimed at the heart of Soviet nuclear strength while enabling the U.S. strategic weapons build-up to continue largely unhindered. Moreover, the proposal neglects strategic bombers and cruise missiles, the areas of a great U.S. lead. This lack of balance is not a formula for successful negotiations.

3. At a minimum, the negotiations as outlined are destined to last many years, enabling most of the nuclear weapons programs underway or planned to move toward completion.

4. The negotiating teams are led by people like Edward Rowny and Paul Nitze who have long been hostile to arms controlagreements with the Soviet Union.

5. The top Administration leaders continue to believe that our nuclear forces are inferior to those of the Soviet Union, a position hardly conducive to compromise and agreement.

Thus it is more important than ever for the Congress and the public to keep the pressure on the Administration to negotiate seriously. The freeze movement, still in its infancy, has to press the call for an immediate, negotiated, mutual and verifiable freeze on the testing, production and deployment of new nuclear weapons. A limited agreement that takes another four or six years to negotiate will be too late and too deficient to cope with the threat of the nuclear holocaust that hangs over the planet.

Most important for this Committee, Congress should not be trapped once again by the old shibboleth that no strategic weapons program can be stopped because of their potential use as "bargaining chips." The history of arms control negotiations is that once these "bargaining chips" are begun, they are virtually impossible to turn off. The cruise missle programs are the clearest example of this.

Moreover, a wasteful and useless program -- MX and B-1B -- remains a wasteful and useless program, no matter what label is given to it. Lastly, these talks are likely to take many years; delaying a termination decision until those negotiations are completed is likely to ensure construction of the weapon, no matter how useless. And the Soviets will respond in kind.

In summary, the Defense Appropriations Subcommittee should be willing to make the hard decisions and to terminate the MX program, the B-1B and the chemical weapons program. If you do not act this year, you will be forced to deal with the budgetary impact for years to come. Moreover, the Soviet Union will certainly respond in kind.

The end result will be a diminishing of our national security and the bringing of the world closer to nuclear destruction. If nothing else, with the higher level of arms, we risk nuclear war due to miscalculation or accident.

The only alternative that promises some hope is a freeze on the nuclear arms race to be followed by reductions in the levels of the current stockpiles. The negotiating process which should lead to a freeze is an extremely difficult one and fraught with uncertainties and tough decisions. But we have no other alternative if we want to spare our country and our civilization the horrors of nuclear war.

Biographical Information on John D. Isaacs

John D. Isaacs is presently Legislative Director of the Council for a Livable World as well as its Washington Director.

Previously, he served as principal foreign affairs Legislative Assistant to Rep. Stephen J. Solarz, Legislative Representative with Americans for Democratic Action and Foreign Service Officer assigned to the pacification program in Vietnam.

Recent publications include:

- "The FY1981 Military Programs", The Bulletin of the Atomic Scientists, June 1980.
- "Our Military Budgets", (with Dr. George Kistiakowsky), American Journal of Public Health, September 1980
- "Reagan's Defense Budget", The Bulletin of the Atomic Scientists, May 1981
- "Three R's of Arms Control: Reagan, Rostow and Rowny", The Bulletin of the Atomic Scientists, September 1981
- "Instruments of War", a chapter with Dr. Kosta Tsipis in _The Final Epidemic_, 1981
- "Defense Budget: Look But Don't Touch", The Bulletin of the Atomic Scientists, February 1982
- "FY 1983 Military Budget," The Bulletin of the Atomic Scientists, April 1982

Senator **Rudman**. Thank you very much, Mr. Isaacs. We appreciate your testimony and also the information which you are constantly affording to us. Most of it is very useful.

Mr. **Isaacs**. Thank you, Mr. Chairman.

NAVAL ENLISTED RESERVE ASSOCIATION

STATEMENT OF MASTER CHIEF JOHN B. THOMAS, JR., USNR (RETIRED), NATIONAL LEGISLATIVE DIRECTOR, NAVAL ENLISTED RESERVE ASSOCIATION

NAVAL RESERVE STRENGTH

Senator **Rudman**. I call on Master Chief John B. Thomas, Jr., representing the Naval Enlisted Reserve Association.

Chief Thomas, your entire statement will be placed in the record.

Master Chief **Thomas**. Thank you, sir. I was going to ask you that, and I will summarize.

I would like to preface my statement with the sincere appreciations on behalf of the Naval Enlisted Reserve Association and myself for the privilege afforded us today to appear before your subcommittee. We also would like to thank the committee for its dedication and determination to provide a strong defense for our country.

Our purpose in appearing before this committee is to discuss the Naval Reserve appropriation issues for 1983. In prior fiscal years 1978 to 1981, the Congress stabilized the Selected Naval Reserve strength at 87,000. Congress increased the Selected Naval Reserve strength in fiscal year 1982 to 94,000.

Our organization suggests that Congress continue the gradual increase in the Naval Reserve strength until the NAMMOS requirements of approximatey 121,000 are met. For 1983 NEBA proposes that funding should be appropriated for an increase to 100,750 Naval Reserve drill pay billets. This will continue the realistic rate of growth recommended by our organization in 1981 and 1982.

It is much less expensive to fund Reserves in peacetime for a wartime mission than to fund them in the Active Force.

Mr. Chairman, although it is probably not within the purview of this committee, NERA recommends congressional direction to the Navy to increase the size and the stability of the recruiting force of the Naval Reserve.

Currently there are approximately 459 canvasser recruiters assigned to the Chief of Naval Reserve to recruit and sustain a selected Naval Reserve of 87,000. NERA proposes that the recruiting force be increased an additional 150 recruiters to effectively recruit the right skill mix of the additional 7,000 billets in the current fiscal year. Stability and security also must be considered for the canvasser recruiter. NERA recommends that the recruiter contract be increased from 1 year to 3 or 4 years.

SELECTED RESERVE ACCOUNTING

The Naval Reserve is comprised of many categories of personnel, for example, the Active Duty, Retired, Standby Reserve, the Ready Reserve, Retired Reserve, and the Selected Reserve.

The Selected Reserve as defined by law are members in a drill pay status. To include TAR's, training, and administration of the Reserve, who are full-time active duty and IMA personnel who are not in a drill pay status as members of the Selected Reserve as proposed by OSD imposes a false drill pay strength.

I will go into NRF ships. The 1981 defense appropriations bill directed the Navy to take certain actions concerning the Naval Reserve force: (1) ship manning, (2) ships operations, (3) command structure, (4) homeporting, (5) replacement ships, and (6) funding.

In the 1982 Defense appropriations report the committee noted that the Navy had accomplished a very small part of these actions. The committee also insisted that the Navy proceed to attain a 50-percent Active and a 50-percent Selected Reserve crew mix with a phase in of TAR personnel to replace the regular Navy crew members. To date 2 years later this has not been accomplished and there isn't any evidence that the Navy plans to carry out the congressional guidance.

Currently two FF-1052 ships have been transferred to the NRF. Each of these ships is commanded by a USN officer vice a TAR officer. This procedure, as that with the enlisted personnel, is not in conformance with the congressional direction to the Navy.

The ships operation and management control was given to the Chief of Naval Reserve by Congress and it has been changed by the Navy to only operating scheduling of the NRF ships. The TYCOMS continue to be responsible for a rescheduling of all other evolutions.

NERA foresees more fleet exercises that are not mission oriented and less readiness training for the Selected Reserve crew as was experienced with the NRF destroyers. NERA supports congressional action that full OPCON and TYCOM be given to the Chief of Naval Reserve.

Homeporting for the other ports is now being explored by the Navy, however with procrastination.

Mr. Chairman, the Naval Enlisted Reserve Association feels the Navy has not expeditiously moved forward to implement congressional direction.

PROCUREMENT

In order not to be repetitious in our testimony here with regard to the P-3 A and B tactical navigation modernization, Navy airlift modernization and Reserve P-3C procurement, the Naval Enlisted Reserve Association fully supports the testimony presented, and I think it is coming up after me, by the Naval Reserve Association.

However, it must be stated that in recent months many commitments by the C-118 to pick up units for airlifting to their drill site had to be canceled because the C-118's were inoperable. Sir, we have people standing on the aprons at these sites and have to go into a Reserve center or be sent home. The C-118's can't carry the load. We need new C-9's or at least C-9's.

Mr. Chairman, this completes our statement and again we thank you for the opportunity to appear before your committee. We will be happy to address any questions you may have or to provide any answers for the committee.

Senator **Rudman**. Chief, thank you very much. We appreciate your testimony.

Master Chief **Thomas**. You are welcome, sir.

[The prepared statement of Master Chief Thomas follows:]

PREPARED STATEMENT OF MASTER CHIEF JOHN B. THOMAS., JR. USNR (RET.)

NATIONAL LEGISLATIVE DIRECTOR

NAVAL ENLISTED RESERVE ASSOCIATION

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE:

I PREFACE MY FORMAL STATEMENT WITH SINCERE APPRECIATION ON BEHALF OF THE NAVAL ENLISTED RESERVE ASSOCIATION AND MYSELF FOR THE PRIVILEGE AFFORDED US TODAY TO APPEAR BEFORE YOUR SUB-COMMITTEE. WE ALSO WANT TO THANK THE COMMITTEE FOR ITS DEDICATION AND DETERMINATION TO PROVIDE A STRONG DEFENSE FOR OUR COUNTRY.

OUR PURPOSE IN APPEARING BEFORE THIS COMMITTEE IS TO DISCUSS THE NAVAL RESERVE APPROPRIATIONS ISSUES FOR FY 1983.

IN PRIOR FISCAL YEARS 1976 THROUGH 1981 THE CONGRESS STABILIZED THE SELECTED NAVAL RESERVE STRENGHT AT 87,000 BILLETS. IN FISCAL YEAR 1982 BUDGET HEARINGS, THE NAVAL ENLISTED RESERVE ASSOCIATION COMMENTED ON THE ADMINISTRATION'S PLANS TO BUILD A 600 SHIP NAVY OVER THE NEXT FIVE YEARS A PLAN THAT OUR ORGANIZATION STRONGLY SUPPORTED. WE ALSO STATED THAT A SIGNIFICANT INCREASE IN NAVAL RESERVE DRILL PAY STRENGTH SHOULD BE INCLUDED TO ALLOW FOR AUGMENTATION IN THE EVENT OF MOBILIZATION, AND IT WOULD BE THE MOST ECONOMICAL MEANS OF PROVIDING WARTIME ASSETS. THE NAVAL ENLISTED RESERVE ASSOCIATION ALSO RECOMMENDED A REALISTIC RATE OF GROWTH TO MEET THE WARTIME REQUIREMENTS VALIDATED BY NAMMOS (NAVY'S MAN POWER MOBILIZATION SYSTEM).CONGRESS INCREASED THE SELECTED NAVAL RESERVE STRENGTH IN FY82 TO 94,000 BILLETS. OUR ORGANIZATION SUGGESTS THAT CONGRESS CONTINUE GRADUAL INCREASE IN THE NAVAL RESERVE STRENGTH UNTIL THE NAMMOS REQUIREMENTS OF APPROXIMATELY 121,000 ARE MET. FOR FY 83 NERA PROPOSES THAT FUNDING SHOULD BE APPROPRIATED FOR AN INCREASE TO 100,750 NAVAL RESERVE DRILL PAY STRENGTH, THIS WILL CONTINUE THE REALISTIC RATE OF GROWTH RECOMMENDED BY OUR ORGANIZATION IN FY81 AND FY82.

IT IS MUCH LESS EXPENSIVE TO FUND RESERVES IN PEACETIME FOR

A WARTIME MISSION THAN TO FUND THEM IN THE ACTIVE FORCE. FAILURE TO PROVIDE FUNDING FOR A GRADUAL INCREASE IN NAVAL RESERVE STRENGTH TO MEET WARTIME REQUIREMENTS APPEARS TO BE UNWISE AND CONTRARY TO THE NATIONAL DEFENSE EFFORT. THE SELECTED NAVAL RESERVE IS THE ONLY SOURCE OF TRAINED MANPOWER IMMEDIATELY AVAILABLE TO AUGUMENT THE ACTIVE NAVY IN THE EVENT OF WAR, NATIONAL EMERGENCY, OR FOR OTHER CONTINGENCIES WHICH WOULD REQUIRE USING PRESIDENTIAL AUTHORITY TO CALL UP AS MANY AS 100,000 SELECTED RESERVISTS FOR A 90 DAY PERIOD.

THE ADDITIONAL COST TO INCREASE AVERAGE DRILL PAY STRENGTH TO 100,750 OVER THE BUDGET FOR FY1983 IS APPROXIMATELY $23 MILLION.

MR. CHAIRMAN, ALTHOUGH IT IS PROBABLY NOT WITHIN THE PURVIEW OF THIS COMMITTEE, NERA RECOMMENDS CONGRESSIONAL DIRECTION TO THE NAVY TO INCREASE THE SIZE AND STABILITY OF THE RECRUITING FORCE OF THE NAVAL RESERVE. CURRENTLY THERE ARE APPROXIMATELY 459 CANVASSER RECRUITERS ASSIGNED TO THE CHIEF OF NAVAL RESERVE TO RECRUIT AND SUSTAIN A SELECTED NAVAL RESERVE OF 87,000. NERA PROPOSES THAT THE RECRUITING FORCE BE INCREASED AN ADDITIONAL 150 RECRUITERS, TO EFFECTIVELY RECRUIT THE RIGHT SKILL MIX OF THE ADDITIONAL 7,000 BILLETS IN THE CURRENT FISCAL YEAR. STABILITY AND SECURITY ALSO MUST BE CONSIDERED FOR THE CANVASSER RECRUITER. AT THE PRESENT TIME A RECRUITER IS RECALLED FOR ONE YEAR AT THE DISCRETION OF THE COMMANDING OFFICER, READINESS COMMANDER AND THE CHIEF OF NAVAL RESERVE. NERA ALSO RECOMMENDS THAT THE RECRUITER CONTRACT BE INCREASED FROM ONE YEAR TO THREE OR FOUR YEARS. MR CHAIRMAN, NAVAL RESERVE RECRUITERS ARE PROFESSIONALS, BUT ARE FACED WITH PRESSURES AND THREATS OF BEING FIRED OR NOT CONTINUED. STABILITY AND SECURITY MUST BE ASSURED.

SELECTED RESERVE ACCOUNTING

THE NAVAL RESERVE IS COMPRISED OF MANY CATEGORIES OF PERSONNEL I.E. ACTIVE DUTY, RETIRED, STANDBY RESERVE, READY RESERVE, RETIRED RESERVE AND SELECTED RESERVE.

THE SELECTED RESERVE AS DEFINED BY LAW ARE MEMBERS IN A

DRILL PAY STATUS. TO INCLUDE TARS (TRAINING AND ADMINISTRATIVE RESERVE) WHO ARE FULL TIME ACTIVE DUTY AND IMA PERSONNEL WHO ARE NOT IN A DRILL PAY STATUS AS MEMBERS OF THE SELECTED RESERVE AS PROPOSED BY OSD IMPOSES A FALSE DRILL PAY STRENGTH.

THE NAVAL ENLISTED RESERVE ASSOCIATION RECOMMENDS THAT CONGRESS REJECT THE ADD-ON OF 11,800 TAR PERSONNEL AND 500 CATEGORY D IMA PERSONNEL FROM THE SELECTED RESERVE STRENGTH.

NRF SHIPS

THE FY 1981 DEFENSE APPROPRIATIONS BILL DIRECTED THE NAVY TO TAKE CERTAIN ACTIONS CONCERNING THE NAVAL RESERVE FORCE (NRF) SHIPS.

1. SHIP MANNING - A CREW OF 50 PERCENT ACTIVE AND 50 PERCENT SELECTED RESERVE WITH A PHASE-IN OF TAR PERSONNEL TO REPLACE THE ACTIVE DUTY CREWS.
2. SHIPS OPERATIONS - NRF ESCORTS WILL OPERATE UNDER THE DIRECTION OF THE CHIEF OF NAVAL RESERVE.
3. COMMAND STRUCTURE - OPERATIONAL CONTROL OF THE RESERVE DESTROYERS WILL BE SHIFTED TO THE CHIEF OF NAVAL RESERVE.
4. HOMEPORTING - NRF SHIPS WILL BE BASED AS MUCH AS POSSIBLE, ON THE DRILLING RESERVIST POPULATION AND THE FEASIBILITY OF COLLOCATING CAPABLE SIMA UNITS.
5. REPLACEMENT SHIPS - THE NAVY WILL PROGRAM THE TRANSFER OF NEWER REPLACEMENT SHIPS (FF-1052's, FFG-1's OR FFG-7's) WITH AN OBJECTIVE OF GROWING TO A FORCE LEVEL OF NOT LESS THAN 24 SHIPS AT LEAST FOUR SHIPS WILL BE TRANSFERRED BY END FISCAL YEAR 1982 AND AT LEAST 12 SHIPS IN THE PERIOD FISCAL YEAR 1982-1987.
6. FUNDING - CHIEF OF NAVAL RESERVE SHALL CONTROL FUNDING OVER ALL NAVAL RESERVE ACTIVITIES. FUNDING FO TAR PERSONNEL SHALL BE UNDER RPN APPROPRIATIONS.

IN THE FY 82 DEFENSE APPROPRIATIONS REPORT THE COMMITTEE NOTED THAT THE NAVY HAD ACCOMPLISHED A VERY SMALL PART OF THESE ACTIONS. THE COMMITTEE ALSO INSISTED THAT THE NAVY PROCEED TO ATTAIN A 50% ACTIVE AND A 50% SELECTED RESERVE CREW MIX, WITH THE PHASE IN OF TAR PERSONNEL TO REPLACE REGULAR NAVY CREW MEMBERS. TO DATE TWO YEARS LATER THIS HAS NOT BEEN ACCOMPLISHED AND THERE ISN'T ANY EVIDENCE THAT THE NAVY PLANS TO CARRY OUT CONGRESSIONAL GUIDANCE. CURRENTLY TWO FF1052'S SHIPS HAVE TRANSFERRED TO THE NRF. EACH OF THESE ARE COMMANDED BY A USN OFFICER VICE A TAR OFFICER, THIS PROCEDURE AS THAT WITH THE ENLISTED PERSONNEL IS NOT IN CONFORMANCE WITH CONGRESSIONAL DIRECTION TO THE NAVY.

THE SHIPS OPERATION AND MANAGEMENT CONTROL GIVEN TO THE CHIEF OF NAVAL RESERVE BY THE CONGRESS HAS BEEN CHANGED BY THE NAVY TO ONLY OPERATIONAL SCHEDULING OF THE NRF SHIPS. THE TYCOMS CONTINUE TO BE RESPONSIBLE FOR THE SCHEDULING OF ALL OTHER EVOLUTIONS PLUS MATERIAL, LOGISTIC AND MAINTENANCE SUPPORT OF THE NRF FRIGATES. NERA FORSEES MORE FLEET EXERCISES THAT ARE NOT MISSION ORIENTED AND LESS READINESS TRAINING FOR THE SELECTED RESERVE CREW AS WAS EXPERIENCED WITH NRF DESTROYERS. NERA SUPPORTS CONGRESSIONAL ACTION THAT FULL OPCON AND TYCOM MUST BE GIVEN TO THE CHIEF OF NAVAL RESERVE.

HOMEPORTING FOR OTHER PORTS IS NOW BEING EXPLORED BY THE NAVY HOWEVER WITH PROCRASTINATION.

MR. CHAIRMAN, NOW THAT THE MARITIME CONVOY ESCORT ROLE HAS BEEN ASSIGNED TO THE NAVAL RESERVE BY MUTUAL AGREEMENT OF THE CONGRESS AND THE NAVY, THE NAVAL ENLISTED RESERVE ASSOCIATION FEELS THE NAVY HAS NOT EXPEDITIOUSLY MOVED FORWARD TO IMPLEMENT CONGRESSIONAL DIRECTION.

PROCUREMENT

IN ORDER NOT TO BE REPITIOUS IN OUR TESTIMONY HEREWITH REGARDS TO THE P3A/B TACTICAL NAVIGATION MODERNIZATION (TAC/NAVMOD). NAVY AIRLIFT MODERNIZATION AND RESERVE P-3C PROCUREMENT, THE NAVAL ENLISTED RESERVE ASSOCIATION FULLY SUPPORTS THE TESTIMONY PRESENTED BY THE NAVAL RESERVE ASSOCIATION.

MR. CHAIRMAN, THIS COMPLETES OUR STATEMENT. AGAIN, WE THANK YOU FOR THE OPPORTUNITY TO APPEAR BEFORE YOUR COMMITTEE. WE WILL BE HAPPY TO ADDRESS ANY QUESTIONS YOU MAY HAVE OR TO PROVIDE ANY ADDITIONAL INFORMATION TO YOU AND TO YOUR COMMITTEE.

Naval Reserve Association

STATEMENT OF CAPT. J. H. BELL, NAVAL RESERVE ASSOCIATION

Senator Rudman. I call on the Naval Reserve Association, represented by Capt. J. H. Bell.

Captain Bell, your entire statement will be incorporated into the record as if read and I would appreciate if you would summarize it.

Captain Bell. Mr. Chairman, I appreciate the opportunity to testify before you today on behalf of the Naval Reserve Association.

Capt. Curtin Coleman, our association president, would normally testify today. However, his honeymoon plans were finalized before the date of this hearing and he was reluctant to cancel out his trip to Canada with his new bride.

He is combining business with pleasure by attending the annual conference of the Naval Officers' Association of Canada also, our counterpart which convenes today in Vancouver, British Columbia.

I plan to review five issues with you today: Naval Reserve strength; the Reserve P-3A/B tactical/navigation modernization; the tactical airlift modernization; the Naval Surface Reserve; and separate procurement accounts for the Reserve components.

The Naval Reserve Association is encouraged by the increased interest shown in the Guard and Reserve by the Congress. Apparently there is more awareness on Capitol Hill as to the advantages of using Guard and Reserve assets in force planning than in the Pentagon.

The initiatives taken by the two Armed Services Committees regarding equipment procurement and force planning for the Guard and Reserve is very heartening. It is hoped that these initiatives will survive the budget process since they offer more immediate force readiness and wartime fighting capability than many of the Active force options.

Having said that, the Naval Reserve Association fully supports the Secretary of the Navy and the Chief of Naval operations in their efforts to achieve maritime superiority in the shortest possible time.

The association also believes there are significant savings to be made in reaching this goal by focusing on the most effective and economical way to do the job. The Naval Reserve can play an important part in effecting these cost savings.

NAVAL RESERVE STRENGTHS

On Naval Reserve strength, now that everyone is finally on board with the Naval Manpower Mobilization System, NAMMOS, it is time to start building the Naval Reserve to its wartime requirement structure. The OSD planning guidance calls for all mobilization manpower requirements to be in place by the end of the fiscal year 1986.

The House Armed Services Committee recognized that the requested Naval Reserve strength was well below the requirements and invited additional appropriations to bring the Naval Reserve strength up. The Naval Reserve Association calls for a steady, straight line increase to reach NAMMOS numbers by the end of fiscal year 1986 which OSD has set as a goal.

We strongly recommend that the committee fund for a 6,750 increase to the proposed Naval Reserve drill end strength for fiscal year 1983 at an additional cost over the budget request of $11.8 million.

P-3A/B tactical/navigation modernization, [TAC/NAV MOD]. This program is essential to the antisubmarine defense of this Nation. The modification, when installed in the Reserve P-3 A's and B's, improves the ASW capability of the aircraft by 75 percent and brings them up to a near baseline P-3C capability. I can think of very few weapon systems which can be so dramatically improved with so little outlay of money.

We strongly urge this committee to support the P-3A/B TAC/NAV MOD program as outlined in our complete testimony.

AIRLIFT MODERNIZATION

The Naval Reserve Association has proposed a leasebuy of used DC-9 aircraft to provide an immediate solution to a very critical shortage of tactical airlift for both the Navy and the Naval Reserve. The ability of the Naval Reserve to provide hands-on training for its personnel and to expand to wartime requirements depends largely on availability of a quick response organic airlift capability.

The used aircraft buy would provide an immediate low cost solution to an acute problem for the next two or even three decades. The Navy has initiated a lease of four used DC-9's with in-house fiscal year 1982 money to get started on this program.

The Naval Reserve Association urges the committee to endorse the purchase plan for used DC-9's as stated in the complete testimony.

NAVAL SURFACE RESERVE

Due to congressional guidance the Navy Surface Reserve is receiving considerable attention these days. NRA recommends that the committee hold firm on its guidance to the Navy concerning operational control of the NRE ships by the Chief of the Naval Reserve and the use of TAR's as the active duty portion of the NRF ship crews. We have offered several suggestions to help alleviate the Navy manning and deployment problems including a modified overseas homeporting policy.

NRA also strongly endorses the ARAPAHO testing program, which we talked about in our complete testimony, and requests the committee's support of the authorization action concerning ARAPAHO.

GUARD AND RESERVE PROCUREMENT ACCOUNT

One of the most desirable and effective actions for improving the combat capability of the Guard and Reserve forces which could be taken by this committee would be to establish separate Guard and Reserve procurement accounts. Such action would provide a very visible indication of the emphasis on each specific component by the parent service and the Congress.

It should also stop the wholesale movement of equipment into the active force while being charged against the Guard and Reserve. Congress could then insure that either new or used equipment was going to the Reserve components in accordance with congressional intention. We strongly urge the committee to recommend the establishment of separate Reserve component procurement accounts.

Mr. Chairman, it is obvious from past experience that if this country is ever going to benefit from the expertise and cost effectiveness of the Guard and Reserve to anywhere near what the potential possibilities are, initiatives will have to continue to come from the Congress.

The services and the Office of the Secretary of Defense all have a deep reluctance to take an objective look at possible additional contributions of the Guard and Reserve to the national defense effort. Even when new or additional tasks are given the Reserve components the necessary support to do the job is often lacking.

NRA has proposed several actions which it believes could be taken to conserve funds and yet produce higher wartime readiness. In addition to those already included in my oral testimony, we recommend that the Navy and the Congress consider using the Reserve air wings, which are already in place, as the 13th and/or 14th Navy air wings for the additional battle groups. The aircraft would have to be modernized, but the personnel and organization are already in place.

CURRENT FLEET AIRCRAFT

The Secretary of the Navy has commenced actions to modernize the Surface Reserve and for the Air Reserve with the introduction of current fleet aircraft. However, we have a long way to go to make up for years of neglect.

Mr. Chairman, the American public will probably continue to support the much needed buildup in the military posture if it can see that everyone in the legislative and executive branch is doing his part to improve combat effectiveness at the lowest possible cost.

The Naval Reserve Association strongly believes that this can be best accomplished by greater use of the Guard and Reserve in defense planning. This is particularly true in the Navy. The Naval Reserve community has the experience, the desire and the potential to assume a significantly greater role in the total Navy structure at much less cost than is presently projected.

For the most part the capability is there if the support is provided. When the Reserve components have been manned and equipped and then have been called, they have performed admirably in combat and in combat support roles.

Mr. Chairman the congressional effort for the Guard and Reserve will be repaid many times in cost-effective, wartime-capable assets.

Thank you, Mr. Chairman.

Senator **Rudman**. Thank you very much, Captain Bell. We appreciate your testimony.

[The prepared statement of Captain Bell follows:]

PREPARED STATEMENT OF CAPT. JOHN H. BELL

U.S. NAVAL RESERVE (RET.)

MEMBER

OF THE

NAVAL RESERVE ASSOCIATION

MR. CHAIRMAN, COMMITTEE MEMBERS, THE NAVAL RESERVE ASSOCIATION THANKS YOU FOR THE OPPORTUNITY YOU HAVE PROVIDED US TO TESTIFY BEFORE YOU TODAY. OUR ASSOCIATION IS VERY APPRECIATIVE OF YOUR SUPPORT AND WE LOOK FORWARD TO WORKING WITH THIS COMMITTEE TO PROVIDE THE MAXIMUM DEFENSE CAPABILITY AVAILABLE FOR THE DOLLARS APPROPRIATED.

THE NAVAL RESERVE ASSOCIATION HAS BEEN VERY DISAPPOINTED WITH THE ADMINISTRATION'S LACK OF FOLLOW-THROUGH ON THE CAMPAIGN AND CONFIRMATION STATEMENTS OF PRESIDENTIAL CANDIDATE REAGAN AND SECRETARY OF DEFENSE DESIGNEE CASPER WEINBERGER. BOTH SPOKE OF THE IMPORTANCE OF THE GUARD AND RESERVE IN THE DEFENSE STRUCTURE AND PLEDGED TO BUILD-UP THE RESERVE COMPONENTS. MR. WEINBERGER STATED THAT THE GUARD AND RESERVE SHOULD, WITHOUT ANY QUESTION, BE STRENGTHENED, PARTIALLY BY GETTING THEM EQUIPMENT THEY WOULD BE USING IN COMBAT. HE ALSO OBSERVED THAT SOME OF THE RESERVE UNITS COULD ALREADY OUTPERFORM THOSE OF THE ACTIVE FORCE AND ADDED THAT, TRADITIONALLY, WE HAVE DEPENDED UPON THE GUARD AND RESERVE AND THAT TRAINED RESERVES ARE NECESSARY FOR A RAPID EXPANDIBLE FORCE.

LAST YEAR THE GUARD AND RESERVE ADD-ONS TO THE BUDGET IN THE AUTHORIZATION BILL WERE, FOR THE MOST PART, DELETED IN THE AUTHORIZATION CONFERENCE AT THE INSISTENCE OF SECRETARY WEINBERGER. THIS YEAR WE SEE NO CHANGE IN THE ATTITUDE THAT HAS EXISTED IN DOD FOR YEARS. WE MADE A STATEMENT LAST YEAR WHICH BEARS REPEATING TODAY, AND I QUOTE, "WORDS WHICH LAVISHLY AND PROFUSELY POUR FORTH IN SUPPORT OF THE RESERVE AND GUARD DO NOT COST MONEY, WHILE PEOPLE, EQUIPMENT AND TRAINING DO" UNQUOTE.

THERE IS NO INCLINATION ON THE PART OF DOD TO CONDUCT, OR HAVE CONDUCTED, IN-DEPTH LOOKS AT POSSIBLE WARTIME ROLES, MISSIONS AND TASKS WHICH COULD BE

ASSIGNED TO THE GUARD AND RESERVE AT CONSIDERABLE DOLLAR SAVINGS. FORTUNATELY THE HOUSE ARMED SERVICES COMMITTEE (HASC) DIRECTED THE SECRETARY OF DEFENSE TO REPORT BY NOVEMBER 30, 1982 ON WHAT ADDITIONAL MISSIONS CAN BE PERFORMED BY RESERVE PERSONNEL. ANOTHER ISSUE IS THE SHORTAGE OF EQUIPMENT IN THE G/R UNITS. IT IS CRIMINAL TO EXPECT SOME OF THE PRESENT UNITS TO GO INTO COMBAT WITH THE OBSOLETE EQUIPMENT ON HAND. NRA APPRECIATES THE EFFORTS OF THE CONGRESS TO CORRECT SOME OF THE EQUIPMENT SHORTFALLS IN THE G/R. IT WAS PARTICULARLY APPRECIATED DURING LAST YEAR'S BUDGET PROCESS AND WE SOLICIT YOUR SUPPORT TO FUND G/R EQUIPMENT PROVIDED FOR IN THE DEFENSE AUTHORIZATION BILL.

NRA IS PLEASED WITH THE STRONG BIPARTISAN EFFORT TO SHORE UP THE DEFENSE ESTABLISHMENT. HOWEVER, WE BELIEVE AS THE HASC APPARENTLY DOES ALSO, THAT MORE THOUGHT AND PLANNING SHOULD BE DEMANDED ON THE PENTAGON'S PART AS TO WHERE THE RESERVE COMPONENTS CAN DO THE JOB AND SAVE CONSIDERABLE MONEY AT THE SAME TIME. MAINTAINING A HUGE STANDING ARMY, NAVY AND AIR FORCE IS TREMENDOUSLY EXPENSIVE AND ANY PORTION OF THAT FORCE WHICH CAN BE ASSUMED BY A RESERVE COMPONENT IS THAT MUCH LESS OF A BURDEN TO THE TAXPAYER. THE PUBLIC MOOD SEEMS TO SUPPORT A BUILD-UP IN OUR DEFENSE ESTABLISHMENT BUT IT WILL NOT TOLERATE NON-ESSENTIAL OR WASTEFUL SPENDING. HOW MUCH EASIER IT WOULD BE TO KEEP A BALANCED STRUCTURE IN DEFENSE IF THE GUARD AND RESERVE WERE TREATED IN A MORE EVEN-HANDED MANNER. THE LARGER THE GUARD AND RESERVE CONTRIBUTION, THE MORE THE SUPPORT FROM THE CITIZENRY.

NRA SUPPORTS THE THESIS THAT THE GUARD AND RESERVE, PROPERLY SUPPORTED, IS THE BEST DEFENSE BUY AVAILABLE TODAY.

THE NAVAL RESERVE ASSOCIATION FULLY SUPPORTS THE SECRETARY OF THE NAVY AND THE CHIEF OF NAVAL OPERATIONS IN THEIR EFFORTS TO ACHIEVE MARITIME SUPERIORITY IN THE SHORTEST POSSIBLE TIME. THE ASSOCIATION ALSO BELIEVES THERE ARE SIGNIFICANT SAVINGS TO BE MADE IN REACHING THIS GOAL BY FOCUSING ON THE MOST EFFECTIVE AND ECONOMICAL WAY TO DO THE JOB.

MR. CHAIRMAN, THE RECOMMENDATIONS MADE TODAY BY THE NAVAL RESERVE ASSOCIATION, IF FUNDED, WILL PROVIDE NOT ONLY CONSIDERABLE DOLLAR SAVINGS IN THE LONG TERM BUT WILL IMPROVE THE READINESS OF THE NAVY IN THE NEAR TERM. THE ISSUES COVERED IN THIS TESTIMONY INCLUDE:

- NAVAL RESERVE STRENGTH
- P-3A/B TACTICAL NAVIGATION MODERNIZATION (TAC/NAV MOD)
- TACTICAL AIRLIFT MODERNIZATION
- NAVAL SURFACE RESERVE
- GUARD AND RESERVE PROCUREMENT ACCOUNTS

NRA HAS MADE CERTAIN ASSUMPTIONS WHICH IT HOPES WILL BE CONSIDERED BY THE COMMITTEE, THE CONGRESS AND THE NAVY. THESE INCLUDE, THE ASSIGNMENT OF THE TWO NAVAL RESERVE AIR WINGS AS THE 13TH AND/OR 14TH NAVY AIR WINGS FOR THE WARTIME BATTLE GROUPS, THE ACKNOWLEDGEMENT OF THE CRITICAL WARTIME ROLE OF THE RESERVE MARITIME PATROL AIR SQUADRONS, AND, THE REQUIREMENT FOR A QUICK RESPONSE AIRLIFT FOR THE NAVY FLEET COMMANDERS IN WARTIME AS WELL AS THE ACTIVE AND RESERVE UNIQUE SUPPORT REQUIREMENTS IN PEACETIME.

ALSO INCLUDED AFTER THE BODY OF THE TESTIMONY ARE FACT SHEETS ON NAVAL RESERVE STRENGTH, RESERVE P-3A/B TAC/NAV MOD AND NAVY AIRLIFT MODERNIZATION IN ORDER TO PERMIT A QUICK REVIEW OF THOSE SUBJECTS.

NOTE - IN THE DISCUSSION IN FAVOR OF AN INCREASED NAVAL RESERVE STRENGTH IT SHOULD BE NOTED THAT THE NAVAL RESERVE ASSOCIATION (NRA) WILL BE USING DRILLING RESERVISTS NUMBERS. OSD HAS, IN ORDER TO INFLATE THE RESERVE NUMBERS, PROPOSED TO INCLUDE ACTIVE DUTY SUPPORT PERSONNEL AND CATEGORY D (NON-DRILLING) RESERVISTS IN ITS SELECTED RESERVE STRENGTH PROPOSAL FOR FY 83 AND THE OUT YEARS. THIS MEANS THAT THE ACTIVE DUTY SUPPORT PERSONNEL ARE DOUBLE COUNTED, (ACTIVE AND RESERVE), AND THE NON-DRILLERS ARE COUNTED IN THE SELECTED RESERVE NUMBERS. NRA BELIEVES THIS PROPOSAL IS CONTRARY TO STATUTE AND CONGRESSIONAL INTENT WHEN THE LAW WAS WRITTEN. CONSEQUENTLY, NRA FIGURES CONTAINED HEREIN DO NOT INCLUDE THE ACTIVE DUTY SUPPORT PERSONNEL NUMBERING 12,038 TAR (TRAINING AND ADMINISTRATION, RESERVE) PERSONNEL AND 550 CATEGORY "D" INDIVIDUAL MOBILIZATION AUGMENTEE (IMA) PERSONNEL. THE ADDITIONAL FUNDS RECOMMENDED ARE FOR DRILLING RESERVISTS AS VALIDATED IN THE NAVY MANPOWER MOBILIZATION SYSTEM (NAMMOS). DRILLING RESERVIST FIGURES IN THIS TESTIMONY DO NOT INCLUDE THE TARS OR IMA CATEGORY "D" PERSONNEL.

NAVAL RESERVE STRENGTH

THE STRENGTH OF THE NAVAL RESERVE FORCE HAS BEEN A CONTROVERSIAL ISSUE SINCE THE FIRST SUCCESSFUL FORAY BY THE OSD BUDGET ANALYSTS CHOPPED OVER 12,000 BILLETS FROM THE NAVY'S RECOMMENDED STRENGTH OF 129,000 FOR FY 1974. THE OSD MEAT AXE APPROACH CONTINUED, CUTTING THE NAVAL RESERVE AUTHORIZED STRENGTH TO 87,000 IN FISCAL YEAR 1978, UNTIL STEMMED THROUGH COUNTERACTIONS BY THE CONGRESS, NRA AND OTHER NAVAL RESERVE SUPPORTERS.

IT APPEARS NOW THAT THROUGH THESE COUNTER EFFORTS, THE NAVY SELECTED RESERVE STRENGTH IS COMMENCING A GRADUAL RISE BACK TOWARDS THE NAVY MANPOWER MOBILIZATION SYSTEM, (NAMMOS), WARTIME REQUIREMENTS OF 120,931 DRILLING RESERVISTS BY THE END FY 1986. ALTHOUGH THE NEW ADMINISTRATION HAS NOT AUTHORED ANY INITIATIVES TO INCREASE THE NR STRENGTH TO ANY APPRECIABLE DEGREE, THE CONGRESS SEEMS QUITE WILLING TO SUPPORT THE NAVY'S WARTIME REQUIREMENTS FOR ITS RESERVE FORCE. THIS WAS EVIDENCED BY THE AFFIRMATIVE ACTIONS TAKEN BY THE APPROPRIATIONS COMMITTEES IN APPROVING THE FUNDING FOR A 92,000 NR IN FY 1981 AND FOR 94,000 IN FY 1982. ADDITIONALLY, THE HOUSE ARMED SERVICES COMMITTEE RAISED THE NR STRENGTH TO 90,000 FROM THE 87,000 SUBMITTED IN THE FY 1982 BUDGET (LATER DROPPED OUT OF THE AUTHORIZATION CONFERENCE) AND DIRECTED THAT A REPORT BE SUBMITTED BY OSD, WITH NAVY INPUT, STATING ITS ACCEPTANCE OR NONACCEPTANCE BY OSD OF THE NAVY MANPOWER MOBILIZATION SYSTEM (NAMMOS).

THE EVALUATION AND CONCLUSION REGARDING NAMMOS REACHED BY OSD AND REPORTED TO THE CONGRESS CAN BE SUMMARIZED AS FOLLOWS:

(1) OSD ACCEPTS NAMMOS AS AN AUTHORITATIVE AND POWERFUL TOOL TO ESTIMATE TIME-PHASED WARTIME MANPOWER REQUIREMENTS AND THE BEST MIX OF SOURCES AVAILABLE TO SATISFY THE MANPOWER REQUIREMENTS.

(2) NAMMOS IS A PROCESS WHICH IMPROVES WITH CONTINUING USE. IT IS A BIG STEP FORWARD AND OSD WHOLEHEARTEDLY SUPPORTS THE NAMMOS CONCEPT.

(3) ALTHOUGH OSD SUPPORTS NAMMOS IT DOES NOT NECESSARILY SUPPORT ALL THE NAMMOS NUMBERS.

(4) WITHIN THE CONSTRAINED PEACETIME BUDGET, NAVAL SELECTED RESERVE MANPOWER MUST BE CONSIDERED AND PRIORITIZED ALONG WITH OTHER RESOURCE

NEEDS. OSD CONCLUDED THAT THE NAVY, WITH OSD PARTICIPATION, HAS DONE AN EXCELLENT JOB IN DEVELOPING NAMMOS, AN ENDEAVOR THAT OSD APPLAUDS.

THE NAVAL RESERVE ASSOCIATION BELIEVES THAT A SIGNIFICANT HURDLE HAS BEEN CROSSED WITH OSD'S ACCEPTANCE OF THE NAMMOS EVEN THOUGH SOME OF THE LANGUAGE APPEARS TO BE WRITTEN IN ORDER TO KEEP FUTURE OPTIONS OPEN. THE CNO STATED AT THE NRA CONFERENCE IN ALBUQUERQUE, BACK IN OCTOBER 1981, THAT HE FULLY SUPPORTS NAMMOS, BUT THAT HE NEVER FUNDS ANYTHING AT 100%. THE PRESENT NAVY PLAN FOR INCREASED NR STRENGTH REACHES 98,654 BY FY 1987. A COMPARISON BETWEEN THAT PLAN AND ONE CALLED FOR BY OSD AND NAVAL RESERVE ASSOCIATION FOLLOWS A BIT LATER IN THIS SECTION.

THE NAVY PLAN FOR THE LOW AND SLOW INCREASE TO WELL BELOW THE NAMMOS REQUIREMENTS IS REPORTEDLY GUIDED BY WHAT SOME CALL ATTAINABILITY. NRA HAS NOT SEEN ANY CONVINCING EVIDENCE THAT THERE CANNOT BE A SIGNIFICANT INCREASE IN THE NR STRENGTH TO NAMMOS NUMBERS. TO THE CONTRARY, IT IS BELIEVED THAT A CONTINUED PHASED CLIMB TO THE REQUIREMENT IS FEASIBLE AND VERY DESIRABLE IF THE STATED OSD/NAVY WARTIME MOBILIZATION REQUIREMENTS ARE VALID. WHILE IT IS TRUE THAT ALL REQUIREMENTS MUST BE PRIORITIZED, IT IS ALSO A FACT THAT IT IS MUCH LESS EXPENSIVE TO FUND RESERVES IN PEACETIME FOR A WARTIME MISSION THAN TO FINANCE THEM IN THE ACTIVE FORCE. FAILURE TO AUTHORIZE AND TO PROVIDE FUNDING FOR A GRADUAL INCREASE IN NR STRENGTH TO MEET WARTIME REQUIREMENTS BY 1986 APPEARS TO BE UNWISE AND CONTRARY TO THE NATIONAL DEFENSE EFFORT.

SEVERAL FACTORS NEED TO BE REMEMBERED WHEN DISCUSSING WARTIME REQUIREMENTS:

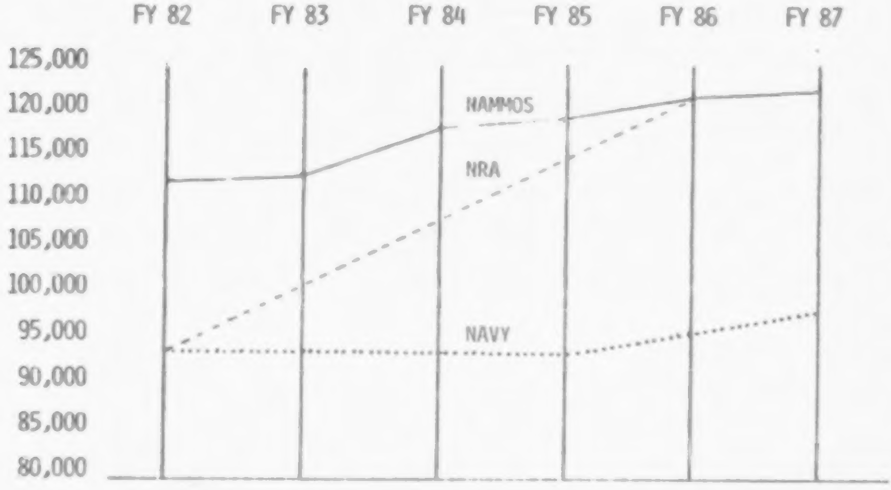
THE SELECTED NAVAL RESERVE IS THE ONLY SOURCE OF TRAINED MANPOWER IMMEDIATELY AVAILABLE TO AUGMENT THE ACTIVE NAVY IN THE EVENT OF WAR, NATIONAL EMERGENCY, OR FOR OTHER CONTINGENCIES WHICH WOULD REQUIRE USING PRESIDENTIAL AUTHORITY TO CALL UP AS MANY AS 100,000 SELECTED RESERVISTS FOR A 90-DAY PERIOD.

IN ADDITION TO THE NAMMOS REQUIREMENT, THE NAVY IS, AND HAS BEEN FOR ALMOST A DECADE, SHORT OF MANY SKILL RATINGS TO MAN THE ACTIVE FORCE SHIPS. IT IS NOT A STATED RESERVE MISSION AT THIS TIME TO HELP MEET THIS SHORTAGE WHICH, AT THE PRESENT TIME, NUMBERS APPROXIMATELY 22,000. ALTHOUGH IT IS UNDERSTOOD THAT THERE IS A MOVEMENT TO IDENTIFY PERSONNEL IN THE INDIVIDUAL

READY RESERVE (IRR) AND THE FLEET RESERVE TO MEET SOME OF THE SHORTAGES, THE PROGRESS SEEMS AGONIZINGLY SLOW.

THE PROGRAM GUIDANCE MEMORANDUM (PGM) BY OSD DIRECTS THAT ALL MOBILIZATION MANPOWER REQUIREMENTS BE SATISFIED BY END OF FY 1986. THE FOLLOWING QUOTE IS AN UNCLASSIFIED EXCERPT FROM THE PGM "...OUR WARTIME MANPOWER SUSTAINABILITY OBJECTIVE IS TO BE ABLE TO SATISFY ALL EXPECTED MOBILIZATION MANPOWER DEMANDS. THE SERVICES AND DEFENSE AGENCIES SHOULD PROGRAM RESOURCES SUCH THAT, BY END - FY 1986, THEY WILL POSSESS THE INVENTORIES, PLANS AND PROCEDURES NECESSARY TO SATISFY THE PROJECTED DEMANDS FOR BOTH MILITARY AND CIVILIAN MANPOWER THROUGH AT LEAST SIX MONTHS OF A (POSSIBLE) WORLDWIDE CONFLICT WITH THE SOVIET UNION...."

THE FOLLOWING CHART SHOWS THE PRESENT PROPOSALS OF NAVY AND NRA IN RELATION TO THE NAMMOS WARTIME REQUIREMENTS BY FISCAL YEAR:



NAMMOS	112,400	113,400	117,398	118,925	120,931	121,187
NAVY	94,000	94,000	94,000	94,000	95,400	98,650
NRA	94,000	100,750	107,500	114,250	121,000	121,187

THERE IS SOME CONSTERNATION WITHIN NAVY CIRCLES ABOUT NOT BEING ABLE TO MEET THE NAMMOS NUMBERS IN THE OUT YEARS. HOWEVER, THE RECRUITERS HAVE NOT BEEN PUT TO THE TEST FOR MANY YEARS. THE YEARS FROM FY 1973 TO FY 1982 HAVE BEEN A TIME OF DECLINING STRENGTH ENDING WITH A STABLE PERIOD OF TWO YEARS. THERE ARE A NUMBER OF INITIATIVES THAT COULD BE TAKEN TO AID IN FILLING THE

WARTIME STRENGTH REQUIREMENTS. IT IS CERTAINLY INCUMBENT ON ALL PARTICIPANTS IN WARTIME PLANNING TO PROVIDE FOR ADEQUATE FORCES TO THE BEST OF THEIR ABILITY.

THE HOUSE ARMED SERVICES COMMITTEE, WHILE NOTING THAT THE REQUIRED NAVAL RESERVE STRENGTH WAS CONSIDERABLY ABOVE THAT REQUESTED, NEVERTHELESS WAS RELUCTANT TO SET A MINIMUM NAVAL RESERVE STRENGTH ABOVE THAT RECOMMENDED BY THE ADMINISTRATION BECAUSE OF ITS CONCERN THAT THE INCREASED STRENGTH COULD NOT BE ATTAINED BY THE NAVY. HOWEVER THE HASC REPORT INCLUDED A STATEMENT TO THE EFFECT THAT IF ADDITIONAL FUNDS WERE APPROPRIATED THE AUTHORIZED MINIMUM STRENGTH WOULD NOT CONSTRAIN THE NEEDED GROWTH.

THE NAVAL RESERVE ASSOCIATION HAS CONCLUDED THAT AN END STRENGTH OF 100,750 DRILLING RESERVISTS IS ATTAINABLE IN FY 1983 IN A LOGICAL SEQUENCE TO FULLFILL NAMMOS REQUIREMENTS BY END OF FY 1986. THIS WOULD COST AN ADDITIONAL $11.7 MILLION AND PROVIDE AN AVERAGE NR DRILL STRENGTH OF APPROXIMATELY 97,375, 3,375 ABOVE THAT REQUESTED BY THE ADMINISTRATION.

RECOMMENDATION:

THE NAVAL RESERVE ASSOCIATION STRONGLY RECOMMENDS THAT THE CONGRESS FUND FOR A 100,750 NAVAL RESERVE DRILLING END STRENGTH FOR FY 1983 AS PART OF A GRADUAL INCREASE IN NAVAL SELECTED RESERVE STRENGTH TO THE NAMMOS FIGURE TO BE REACHED BY END OF FY 1986. (AVERAGE DRILL STRENGTH 97,375). THE ADDITIONAL COST OVER THE BUDGET FOR FY 1983 IS $11.8 MILLION.

P-3A/B TACTICAL NAVIGATION MODERNIZATION (TAC/NAVMOD)

THE TAC/NAV/MOD PROGRAM IS A TOP PRIORITY FOR THE NAVAL RESERVE. THE 13 RESERVE MARITIME PATROL (VP) SQUADRONS CONSTITUTE 35% OF THE TOTAL NAVY MARITIME PATROL AIRCRAFT (MPA) FORCE, OVER ONE THIRD OF THE MOST EFFECTIVE COUNTER WEAPON THE NATION POSSESSES TO COMBAT THE SOVIET SUBMARINE THREAT.

THE NAVY, THROUGH A PROGRAM OF UPGRADING AND MODERNIZATION, HAS BEEN ABLE TO KEEP ITS MARITIME PATROL AIRCRAFT UP TO THE STATE OF THE ART FROM 1945 WHEN THE P-2 NEPTUNE WAS FIRST INTRODUCED TO THE MID-1990S WHEN THE P-3 ORION IS SCHEDULED TO BE PHASED OUT.

THROUGH AN UNFORTUNATE SERIES OF EVENTS, HOWEVER, ONLY A FEW OF THE NAVAL RESERVE P-3A/B AIRCRAFT HAVE BEEN UPGRADED WITH THE TACTICAL/NAVIGATION

MODERNIZATION PACKAGE. THIS PACKAGE TAKES A BASIC P-3A/B AIRCRAFT AND BRINGS IT UP TO A NEAR BASELINE P-3C CAPABILITY. THE PROGRAM ADDS TACTICAL NAVIGATION COMPUTER, TACTICAL DISPLAY, OMEGA NAVIGATION AND THE VERNIER AQA-7 SENSOR. THE LOCALIZATION PERFORMANCE AND THE ABILITY OF THE MODIFIED AIRCRAFT TO MEET ATTACK CRITERIA AND EFFECTIVELY DELIVER WEAPONS ARE SIGNIFICANTLY IMPROVED. ONE RELIABLE ESTIMATE ESTABLISHED THE IMPROVEMENT IN CAPABILITY AT 75%.

IT IS VERY OBVIOUS TO ANY QUALIFIED ANALYST THAT THE RELATIVELY MODEST COST ADDRESSED IN THIS ISSUE TO SIGNIFICANTLY IMPROVE A WEAPONS SYSTEM, CRITICAL TO THE NATION'S DEFENSE, IS MONEY WELL SPENT. CONVERSELY, IT WOULD BE GROSS NEGLIGENCE ON OUR PART TO ACCEPT THE LESSER CAPABILITY OF THE NON-MODERNIZED AIRCRAFT UNLESS WE WERE TO GAMBLE THAT WE DID NOT NEED A MODERN WEAPON SYSTEM TO COMBAT THE MOST FORMIDABLE SUBMARINE FORCE IN HISTORY.

THE NON-MODERNIZED AIRCRAFT HAVE, (WITHOUT A JURY RIGGED NAVIGATION SYSTEM), LOST THEIR CAPABILITY TO OPERATE IN AN OPEN OCEAN ASW ENVIRONMENT. LORAN CHARLIE, WHICH IS THE LAND BASED REPLACEMENT FOR THE DECOMMISSIONED LORAN ALPHA SYSTEM, IS NOT SATISFACTORY FOR WORLD-WIDE COVERAGE AND IS, AT BEST, A BACK-UP SYSTEM FOR ASW MISSIONS. LORAN IS ALSO AN EXTERNAL SOURCE SYSTEM AND IS SUBJECT TO SHUTDOWN BY OUTSIDE INTERESTS IN A WARTIME SITUATION.

LAST YEAR BOTH AUTHORIZATION BILLS INCLUDED AN ADD-ON FOR $30.3 MILLION TO STEP UP THE BUY OF THE TAC/NAVMOD KITS FOR RESERVE AIRCRAFT FROM THE ADMINISTRATION'S SUBMISSION OF 15 AIRCRAFT TO 36 P-3A/BS AS PROPOSED BY NRA. THE ADD-ON WAS DELETED FROM THE AUTHORIZATION BILL BY THE CONFERENCE COMMITTEE AT THE INSISTENCE OF OSD. TO COMPOUND MATTERS, AND BECAUSE OF THE LATE DELETION OF THE ADD-ONS BY THE CONGRESS, NAVY DID NOT INCLUDE ANY MODIFICATIONS IN THE FY 1983 PROPOSED BUDGET.

OF THE 134 P-3A/B AIRCRAFT IN THE NAVAL RESERVE, ONLY 63 HAVE BEEN MODIFIED. THE NAVY ORIGINALLY DID NOT PLAN TO MODIFY ALL RESERVE P-3A/BS, REASONING THAT THE P-3BS FROM THE ACTIVE FORCE, ALREADY MODIFIED, WOULD MIGRATE TO THE RESERVE FORCE AND THAT A THREE TO FOUR YEAR PERIOD, WHERE UP TO 29 AIRCRAFT IN THE RESERVE INVENTORY WOULD BE UNMODIFIED, WAS AN ACCEPTABLE RISK. THE NAVY'S DECISION TO LOWER THE PROCUREMENT RATE OF THE P-3C OVER THE NEXT FIVE YEARS MAKES IT EVEN MORE IMPORTANT TO INCORPORATE THE TAC/NAVMOD SYSTEM IN ALL THE RESERVE BIRDS.

THE NAVY PROPOSAL TO LOWER THE P-3C PROCUREMENT FROM 12/YEAR TO FIVE PER YEAR IS UNFORTUNATE OVER THE LONG HAUL FOR SEVERAL REASONS: (1) IN ORDER TO KEEP FROM HAVING TO DISESTABLISH VP SQUADRONS COMMENCING IN THE EARLY 1990s A PROCUREMENT INCREASE TO 20 P-3Cs WOULD BE REQUIRED, (2) AN INCREASE TO THE 20 AIRCRAFT/YEAR WOULD RESULT IN THE SAVINGS OF APPOXIMATELY 10% IN COSTS OVER THE PROJECTED 12/YEAR SCHEDULE, THE DECREASE WILL ACTUALLY INCREASE THE UNIT COST, (3) NO FOLLOW-ON VP AIRCRAFT IS YET ON THE R&D BOARD, AND (4) SINCE THE PRESENT VP FORCE DOES NOT MEET PROJECTED WARTIME REQUIREMENTS A CUTBACK IN AN ALREADY INADEQUATE PROCUREMENT PLAN SERIOUSLY COMPOUNDS THE PROBLEMS OF FULFILLING THE REQUIRED COMMITMENT IN THE OUT YEARS.

RECOMMENDATION:

NRA PROPOSES, THEREFORE, THAT THE CONGRESS FUND, ON A MULTI-YEAR BASIS, THE TAC/NAVMOD TO THE 71 REMAINING NAVAL RESERVE P-3A/B AIRCRAFT ON AN EXPEDITIOUS BASIS, (FY83 AND FY84), THUS PROVIDING THE NATION WITH THE MOST CAPABLE WEAPON SYSTEM AVAILABLE IN THE SHORT TERM AT A VERY REASONABLE COST TO THE TAXPAYER.

RESERVE P-3A/B TAC/NAVMOD

(COST IN $ MILLIONS, FY 83 DOLLARS)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84
KITS PROCURED	14	0	34	15		
PROCUREMENT REQUIRED					36	35
(COST)*					(50.4)	(49.0)
UNMODIFIED A/C	120	120	86	71	35	-0-

* BASED ON MULTI-YEAR PROCUREMENT. (NAVY INSTALLATION CAPABILITY IS 36/YEAR).

NAVY AIRLIFT MODERNIZATION

THE MODERNIZATION OF THE NAVY'S AIRLIFT CAPABILITY SEEMS TO BE THE LONGEST AND MOST PERSISTENT PROBLEM BEING ADDRESSED BY THE NRA TODAY.

EVER SINCE THE LATE 1960s THERE HAS BEEN A RUNNING BATTLE BEING WAGED BETWEEN NAVY AND OSD AS TO WHAT NAVY'S REQUIREMENTS ARE IN INTRA-THEATER AIRLIFT. THE PROBLEM SEEMED TO BE SOLVED WHEN THE PROCUREMENT OF C-9B AIRCRAFT WAS

APPROVED BY THE CONGRESS IN FY 73. ALTOGETHER, 14 C-9BS WERE PURCHASED FOR NAVY AND MARINE USE, OSD THEN DECIDED TO CONSOLIDATE ALL AIRLIFT UNDER THE MILITARY AIRLIFT COMMAND (MAC). THE CONSOLIDATION DECISION BY OSD ACCOMODATED NAVY AIRLIFT REQUIREMENTS USING "FREE" EXCESS FLYING HOURS IN THE MAC INVENTORY WITHOUT HAVING TO PURCHASE ADDITIONAL AIRCRAFT. IN OTHER WORDS THE SUPPORT WAS SUPPOSED TO BE FREE. OBVIOUSLY THE FREE RIDE NEVER HAPPENED BUT OSD, UP UNTIL RECENTLY, WOULD NOT BACK OFF ITS ORIGINAL STAND DESPITE THE FACT THAT ALL THE ASSUMPTIONS UPON WHICH THE DECISION WAS BASED WERE INVALID.

THE AIR FORCE RESPONDED TO THE DECISION TO CONSOLIDATE BY STATING THAT ADDITIONAL ASSETS (AIRCRAFT AND FLIGHT HOURS) WERE NECESSARY TO ABSORB THE ADDITIONAL NAVY REQUIREMENTS. A TEST OF THE MAC CAPABILITY TO ASSUME THE NAVAL RESERVE WEEKEND AIRLIFT REQUIREMENTS, IN JULY-AUGUST OF 1977, WAS A RESOUNDING FAILURE. THE SERVICE WAS POOR AND THE COST TWICE THAT OF BETTER SERVICE WITH C-9BS.

THE CONGRESS IN ITS HEARINGS ON THE MATTER HAS REJECTED THE CONSOLIDATION EFFORT FOR THE LAST SIX YEARS AND, IN SPITE OF OSD PROTESTS, HAS VOTED TO ADD C-9BS TO THE BUDGET IN TWO OF THE PAST FOUR YEARS, ALBEIT IN SMALL NUMBERS BECAUSE OF THE OSD OPPOSITION.

AS PART OF THE OSD PLAN TO CONSOLIDATE THE AIRLIFT EFFORT AN ATTEMPT WAS MADE FOR FOUR YEARS TO GET RID OF THE C-118S WHICH THE NAVAL RESERVE WAS USING TO HANDLE ITS OWN AND SOME OF THE FLEET REQUIREMENTS. EACH YEAR THE CONGRESS RESTORED THE OLD RELIABLE C-118S TO THE FORCE UNTIL TWO YEARS AGO WHEN OSD FINALLY ADOPTED A FIVE YEAR PHASEOUT PLAN FOR THAT AIRCRAFT. NRA WARNED AT THAT TIME THAT THERE SHOULD BE NO FURTHER EXTENSION OF THE C-118S BECAUSE THEY WERE FAST REACHING THE POINT OF DIMINISHING RETURNS.

AS A RESULT OF THE PHASEOUT PLAN ONE VR UNIT AT NEW ORLEANS HAS ALREADY BEEN DISESTABLISHED. REPLACEMENT AIRCRAFT FOR THE C-118S HAVE NOT BEEN FORTHCOMING, CONSEQUENTLY, MORE UNITS AT DETROIT, MEMPHIS, ATLANTA, WHIDBY ISLAND, GLENVIEW AND WILLOW GROVE WERE SCHEDULED TO BE DISESTABLISHED IN THE PERIOD FY 1982 THROUGH FY 1985. ONCE LOST, THE TREMENDOUS TALENT AND EXPERIENCE AVAILABLE IN A SQUADRON WOULD BE VERY DIFFICULT TO RECOVER. THE BUILDING OR REBUILDING OF A SQUADRON IS A RELATIVELY SLOW PROCESS. SECRETARY LEHMAN CLEARLY UNDERSTANDS THIS PROBLEM. HE ISSUED A MESSAGE THAT HELD ALL DISESTABLISHMENTS IN ABEYANCE PENDING RESOLUTION OF THE RESERVE AIRLIFT ISSUE.

The Secretary's action saved VR-52 in Detroit from immediate disestablishment and pumped new life into the unit. Both Secretary Lehman and the CNO, Admiral Hayward, have taken a personal interest in finding an immediate solution to the C-118 replacement program. That interest and leadership is vital to the resolution of the problem and is sincerely appreciated.

The question is frequently asked, "why does the Navy need its own airline?" First of all, Title 10 U.S.C. 5012(b) directs that there be Navy organic, "air transport essential for naval operation." The C-9B aircraft was originally selected from among a sizeable number of candidates as the best aircraft available to accomplish the mission of support to the Fleet Commanders. There is nothing that is so responsive to the Navy unique airlift requirements of short lead time, low volume, high frequency of demands to a multiplicity of mostly unpredictable fleet locations, as an organic airlift. The Air Force agreed with the above assertion during the Defense Tactical Airlift Modernization (DODTAM) study conducted by OSD in 1978. That study also confirmed the need for 37 additional C-9Bs in order to satisfy the Navy's requirements. A modest Navy organic airlift capability was determined to be the only method of providing the requisite response.

Once the requirement was validated, the next step was to find the most efficient and cost effective manner of providing the service. NRA believes the airlift system now in place in the Navy provides the best of all possible worlds. Naval Reservists fly all the Naval Logistics Airlift Support in the Continental United States (CONUS) and some overseas intra theatre support. This has been expanded to include a commitment to maintain an aircraft at certain times in support of the Sixth Fleet in the Mediterranean. The Naval Reserve can handle this deployment by scheduling Reservists on a heel and toe or back to back two week deployments as is also being done in the VP community at several locations.

Each Reserve VR squadron is large enough so that the Selected Air Reservists can fly all the scheduled missions in peacetime and are immediately available for a surge to triple the peacetime flight schedule in wartime or other national emergency. The crews, which are all inactive reservists except for a few TARs (Training and Administration of Reserve), are basically paid for only the time

THEY ARE FLYING. THESE AIRCRAFT, WHICH SATISFY THE WARTIME REQUIREMENT TO SUPPORT THE FLEET COMMANDERS, CAN BE EFFECTIVELY USED IN PEACETIME TO SUPPORT FLEET AND RESERVE NEEDS NOT AMENABLE TO MAC CAPABILITIES. THIS ORGANIC SUPPORT ACCOUNTS FOR ONLY 20% OF THE NAVY'S AIRLIFT REQUIREMENTS, THE REST IS HANDLED BY MAC AND CIVILIAN COMMERCIAL ASSETS.

THE PEACETIME USE OF THE AIRLIFT ASSETS BY THE NAVAL RESERVE IS ESSENTIAL TO THE READINESS AND PERSONNEL STABILITY OF THE NAVAL RESERVE. DUE TO THE CONSOLIDATION OF MOST OF THE RESERVE AIR ACTIVITIES AT USN LOCATIONS, (OUT OF THE HIGH POPULATION AREAS), AND THE NEED TO PROVIDE HANDS ON TRAINING TO SURFACE RESERVISTS, THE IMPORTANCE OF A RESPONSIVE AIRLIFT IS OBVIOUS IF WE ARE TO EXPAND OR EVEN RETAIN THE PRESENT NAVAL RESERVE FORCE.

THIS YEAR HAS NOT ONLY SEEN THE SECRETARY OF THE NAVY, JOHN LEHMAN, AND THE CHIEF OF NAVAL OPERATIONS, ADMIRAL HAYWARD, GIVE HIGH PRIORITY TO REPLACING THE AGED C-118S IN THE NAVAL RESERVE, BUT THE OSD RESISTANCE TO THE ACQUISITION OF A REPLACEMENT AIRCRAFT APPEARS TO HAVE SWITCHED TO A SUPPORTIVE POSITION. NRA HOPES THAT, AT LONG LAST, THE NAVY LOGISTICS AIRLIFT CRISIS CAN BE RESOLVED AND THE GOAL OF IMPROVING THE COMBAT READINESS STATUS OF NAVY ACTIVE AND RESERVE UNITS/INDIVIDUALS CAN BE REALIZED.

NRA HAS BACKED OFF ITS STRONG RECOMMENDATIONS OF THE PAST EIGHT YEARS THAT ALL OF THE NAVY'S ORGANIC LOGISTICS AIRLIFT REQUIREMENTS BE FILLED BY NEW C-9B AIRCRAFT. THE AVAILABILITY OF USED DC-9S ON THE MARKET HAS PROVIDED A VERY ATTRACTIVE AND LOGICAL ALTERNATIVE TO NEW AIRCRAFT BECAUSE OF THE IMMEDIATE AVAILABILITY AND VERY ATTRACTIVE COST OF THE USED PLANES. THERE IS A SACRIFICE IN CAPABILITY AND LONGEVITY BETWEEN THE USED AIRCRAFT AVAILABLE FOR LEASE/PURCHASE AND NEW C-9BS. THE C-9B HAS BETTER RANGE AND FLEXIBILITY WITH ITS EXTRA FUEL CAPACITY AND CARGO CONVERTIBILITY. HOWEVER, THERE IS AN IMMEDIATE CRITICAL NEED TO PROVIDE THE NAVAL RESERVE WITH REPLACEMENT AIRLIFT AIRCRAFT AND THIS CAN BE ACCOMPLISHED BY THE ACQUISITION OF USED DC-9S. THE USED DC-9S INCLUDED IN NRAS PROCUREMENT PLAN CAN BE MODIFIED BY THE NAVY AFTER PURCHASE IF IT IS DEEMED APPROPRIATE. THE EXTENT OF THE MODIFICATION/S OF THE USED DC-9S WOULD DEPEND ON THE CONFIGURATION/S REQUIRED BY THE NAVY AND THE SERIES OF AIRCRAFT SELECTED FOR PROCUREMENT. IT IS EMPHASIZED HOWEVER, THAT THE USED AIRCRAFT PROPOSED HEREIN WOULD HAVE A NAVY SERVICE LIFE OF FROM 17 TO 30 YEARS

BASED UPON THE SCHEDULED UTILIZATION OF 120 HRS/MONTH AND A SERVICE LIFE CONSERVATIVELY ESTIMATED AT 75,000 HOURS.

THE BUY AND LEASE CHARTS FOR USED DC-9S ARE EXTRACTED FROM THE BEST ESTIMATES AVAILABLE AT THIS TIME. THE USED AIRCRAFT MARKET IS A FLUID ONE. A DISTINCT VARIABLE IS THE SERIES AND MODEL AIRCRAFT WHICH THE NAVY SELECTS AS ITS CHOICE.

NRA HAS STATED ITS RECOMMENDATIONS BASED ON AN UNSOLICITED OFFER TO SELL OR LEASE BY A SPECIFIC AIRCRAFT USER. THE AIRCRAFT BASICALLY IS A DC-9-31 WITH 35,000 HOURS. THE PRICE INCLUDES CONSIDERABLE SPARES AND SUPPORT EQUIPMENT ADEQUATE FOR 12 PLANES - AND - THE PRICE IS NEGOTIABLE AT THIS TIME. NRA BELIEVES THAT THE TIME FOR PURCHASING USED AIRLIFT AIRCRAFT IS NOW. OTHER DC-9S OF OLDER VINTAGE AND LESSER CAPABILITY HAVE BEEN AVAILABLE FOR COMMENSURATELY LOWER PRICES.

THE NAVAL RESERVE ASSOCIATION CALLS FOR THE ADOPTION OF A PLAN WHICH ACCOMPLISHES TWO GOALS - (1) THAT OF SUPPLYING THE WARTIME FLEET COMMANDERS WITH A QUICK RESPONSE LOGISTIC AIRLIFT SUPPORT, AND (2) PROVIDING AN IMMEDIATE FIX FOR THE CURRENT PAUCITY OF NAVY LOGISTICS AIRLIFT ASSETS BY REPLACING THE AGED AND AILING C-118S WITH USED DC-9S AVAILABLE FROM A COMMERCIAL SOURCE FOR ABOUT $93.8 MILLION FOR EIGHT AIRCRAFT IN FY 83, APPROXIMATELY $73.5 MILLION ABOVE THE BUDGET REQUEST. REGARDLESS OF WHETHER SUCH AIRCRAFT ARE LEASED OR PURCHASED, LEASING BEING AN ALTERNATIVE, THERE WOULD BE SOME SITE SUPPORT START UP COST. THE EXPECTED COSTS OF THE TWELVE AIRCRAFT UNDER THE TWO ALTERNATE PLANS APPEAR BELOW. THE CHARTS ARE BASED UPON A SPECIFIC OFFER TO LEASE OR SELL USED DC-9-31 AIRCRAFT. THE DECISION TO LEASE OR BUY A DIFFERENT SERIES OF AIRCRAFT COULD CHANGE THE AMOUNTS SHOWN CONSIDERABLY. OFFSETS SHOWN IN FY 83 ARE $16.2 MILLION IN PROCUREMENT FUNDS INTENDED FOR THE PURCHASE OF TWO USED DC-9S, AND $4.1 MILLION IN O&MNR WHICH CONSISTS OF HALF YEAR FUNDING FOR THE C-118 OVERHAULS AND FLIGHT HOURS. THE CHART ALSO ASSUMES THAT THE NAVY ENTERS INTO A LEASE FOR FOUR (4) USED DC-9S IN FY 1982 WHICH IS THE INTENTION AT THIS WRITING. (ALL FIGURES ARE CONSTANT 83 DOLLARS IN THE MILLIONS)

Buy Used DC-9s (8/FY 83, 4/FY 84)

Fiscal Year	FY-83	FY-84	FY-85
Flyaway Cost	(8) 50.0	(4) 25.0	(0) -
Site Support*	8.0	2.5	-
Spares (Initial)*	16.0	8.0	-
O&MNR (POL)	14.3	19.0	19.0
O&MNR (Maintenance)	4.7	6.2	6.2
O&MNR (Training)**	.8	-	-
Sub Total	93.8	60.7	25.2
Less FY 83 Budget Procurement	(16.2)		
Less FY 83 C-118 O&MNR (1/2 Year)	(4.1)		
Total	73.5***		
(Procurement 57.8 O&MNR 15.7)***			

*Costs based upon a known offer of used DC-9-31 aircraft which includes much site support and spare parts.
**Training costs for 64 pilots and 22 enlisted crew.
***Over budget request

Lease 12 Used DC-9s

Fiscal Year	FY-83	FY-84	FY-85
Lease (O&MNR)	12.0	12.0	12.0
Site Support*	11.4	-	-
Spares (Initial)*	21.0	-	-
O&MNR (POL)	14.3	14.3	14.3
O&MNR (Maintenance)	4.7	4.7	4.7
O&MNR (Training)**	.8	-	-
Sub Total	64.2	31.0	31.0
Less FY 83 Budget Procurement	(16.2)		
Less FY 83 C-118 O&MNR	(4.1)		
Total	43.9***		
(Procurement 16.2 O&MNR 27.7)***			

Summary - Navy Airlift Modernization

The unique airlift requirements of the Navy are best satisfied by a Navy organic airlift capability. This has been verified through congressional hearings and budget actions, through Navy studies, through an OSD study (DODTAM) and through public law 10 USC 5012(b). The present C-118s have been flying over 30 years and are giving up faster even than planned which, unless something is done expeditiously, will cause a lot of highly trained Reservists to go home for lack of billets. The case for the C-9B to serve the needs of the Fleet Commanders in wartime is well documented as being the best of the options available.

The C-9B has the best dispatch reliability rate of any operational aircraft in the military inventory (97.0%+ in CONUS). It is flown by Naval Reservists and is manned to triple its flight hour schedule for wartime surge

REQUIREMENTS. NRA BELIEVES THAT THERE IS NO MORE COST EFFECTIVE OPERATION IN THE DEFENSE ESTABLISHMENT TODAY.

THE NAVY HAS INITIATED ACTION TO LEASE USED DC-9 AIRCRAFT COMMENCING IN FY 1982. AN ENDORSEMENT OF THE INITIATIVE AS WELL AS THE AUTHORIZATION AND FUNDING FOR EIGHT (8) USED DC-9S IS NECESSARY TO FULFILL SOME IMMEDIATE NAVY ORGANIC LOGISTICS AIRLIFT REQUIREMENTS. NOW IS THE TIME TO NEGOTIATE FOR THE BEST PRICE ON USED AIRCRAFT.

NRA BELIEVES ITS PROPOSED LOGISTICS AIRLIFT PACKAGE IS THE MOST REASONABLE ALTERNATIVE AVAILABLE TO SOLVE THE IMMEDIATE REQUIREMENT FOR ADDITIONAL AIRLIFT ASSETS IN THE NAVY AND TO ACCOMPLISH IT IN THE MOST ECONOMICAL MANNER.

RECOMMENDATION:

THAT THE CONGRESS FUND THE ADDITIONAL COSTS OF $73.5 MILLION FOR EIGHT (8) USED DC-9 AIRCRAFT IN FY 83.

THE NAVAL SURFACE RESERVE

THE NAVAL RESERVE FORCE IS RECEIVING A GREAT DEAL OF ATTENTION THESE DAYS, PARTICULARLY THE SURFACE RESERVE. THE CNO, ADMIRAL HAYWARD, SAID IN HIS POSTURE STATEMENT THAT THE NAVAL RESERVE HAD MADE IMPRESSIVE READINESS IMPROVEMENTS, THANKS TO THE PERSISTENT EFFORTS OF THE CONGRESS. SECRETARY LEHMAN SPOKE OF THE INTRODUCTION OF THE FF-1052 KNOX CLASS FRIGATES, THE FFG-7 PERRY CLASS FRIGATES, TO INCLUDE AT LEAST 24 FRIGATES, AS WELL AS UPDATED AND MODERN MINE WARFARE AND SUPPORT CRAFT.

NRA APPLAUDS THE "NEW LOOK" FOR THE NAVAL SURFACE RESERVE FORCE AND THANKS THE CONGRESS FOR ITS PERSISTENCE IN MODERNIZING THE SURFACE NRF. THE PROGRAM IS RECEIVING TOP LEVEL ATTENTION IN THE NAVY NOW, CONSEQUENTLY, IT HAS A GOOD CHANCE OF SUCCEEDING. THERE ARE A FEW CONGRESSIONAL GUIDANCE ISSUES NOT YET IMPLEMENTED BY THE NAVY WHICH WILL BE DISCUSSED LATER, HOWEVER, NRA BELIEVES THAT WITH SUPPORT FROM THE NAVY AND THE CONGRESS, A GREATER CONTRIBUTION CAN BE MADE TO THE TOTAL FORCE BY THE NAVAL RESERVE. A LONG RANGE PLAN IS NECESSARY WITH A MIGRATION OF CURRENT ASSETS FROM THE ACTIVE FORCE INTO THE

NAVAL RESERVE. THIS PLAN WOULD ENABLE THE ACTIVE FORCE TO CONCENTRATE ON PEACETIME DEPLOYMENTS, IMPROVEMENT OF TACTICS AND THE DEVELOPMENT OF NEW WEAPONS SYSTEMS. IN OTHER WORDS, THE NAVAL RESERVE WOULD GRADUALLY BUT SYSTEMATICALLY ASSUME MANY OF THE WARTIME MISSIONS NOW IN THE ACTIVE FORCE.

ONE OF THE MISSIONS WHICH THE NAVAL RESERVE DOMINATES IS THE MINE WARFARE ROLE. AS THE CNO STATED IN HIS POSTURE STATEMENT, THE MINE WARFARE TASK WAS NEGLECTED DURING THE PAST DECADE. AS A RESULT THE MINESWEEPERS NOW IN THE NRF ARE BEING DECOMMISIONED WITH NO REPLACEMENTS FOR SEVERAL YEARS. (THE LOW PRIORITY GIVEN MISSIONS IN THE NAVAL RESERVE IS A PROBLEM WHICH NEEDS TO BE OVERCOME). THE CNO HAS ALSO SAID THAT THE MINE WARFARE MISSION BELONGED TO THE NAVAL RESERVE AND THAT THE NEW MINE COUNTERMEASURE SHIPS WILL BE ASSIGNED TO THE NAVAL RESERVE AFTER A SHORT SHAKEDOWN PERIOD IN THE ACTIVE FORCE. IT IS HOPED THAT MINE WARFARE WILL BE GIVEN A HIGH PRIORITY IN THE BALANCED FORCE REFERRED TO BY SECRETARY LEHMAN. WITH THE TREMENDOUS MINE-LAYING CAPABILITY OF THE SOVIETS OUR SEAPORTS COULD BE BOTTLED UP FOR LONG PERIODS OF TIME WITHOUT MINE COUNTERMEASURE SYSTEMS TO CLEAR THE HARBOR APPROACH AND DEPARTURE LANES. THE HELICOPTER MINESWEEPERS WERE SCHEDULED INTO THE NAVAL AIR RESERVE AT ONE TIME, BUT THE TRANSFER WAS CANCELLED WHEN THE ACTIVE FORCE DECIDED THAT IT NEEDED THE EQUIPMENT FOR THE VOD (VERTICAL ON BOARD DELIVERY) FOR THE REPLENISHMENT AT SEA TASK. MINE WARFARE IS BASICALLY A WARTIME MISSION AND LOGICALLY BELONGS IN THE RESERVE.

ONE OF THE OBJECTIONS TO PLACING MORE HARDWARE INTO THE NAVAL RESERVE WAS THAT THE WEAPONS SYSTEMS WERE TOO SOPHISTICATED FOR RESERVISTS. THAT IS CONSIDERED A SMOKESCREEN FOR THE REAL DESIRE OF MANY SENIOR NAVAL OFFICERS TO KEEP ALL THE HARDWARE IN THE ACTIVE FORCE AND HAVE A BIG MANPOWER POOL OF RESERVISTS TO DRAW UPON WHEN TROUBLE COMES.

SUFFICE IT TO SAY THAT THE RESERVIST IS AN EXPERIENCED NAVY VETERAN AND HE BECOMES MORE SKILLED AS HE DRILLS AND PERFORMS TRAINING DUTY ON HIS PLATFORM. THIS IS ONE OF THE MAIN REASONS FOR SUPPORTING THE CONGRESSIONAL GUIDANCE THAT THE ACTIVE PORTION OF THE 50%/50% ACTIVE/RESERVE MIX ABOARD THE NRF FRIGATES BE ALL TAR (TRAINING AND ADMINISTRATION RESERVE) PERSONNEL. THIS ENABLES THE ACTIVE CREWS OF THE SHIPS TO REMAIN LONGER ABOARD A SHIP, BECOME TRUE EXPERTS IN THEIR JOBS ABOARD THE SHIP, KNOW THE SELECTED RESERVISTS WHO WILL WORK WITH THEM, AND IN THE FINAL ANALYSIS, RUN A BETTER

SHIP IN AN ABBREVIATED TRAINING PERIOD. NRA BELIEVES THAT THE NAVY COMPLIANCE TO CONGRESSIONAL DIRECTION IN THIS INSTANCE IS TANTAMOUNT TO THE SUCCESS OF THE RESERVE FRIGATE PROGRAM. USN ROTATION POLICES REQUIRING FREQUENT MOVES OF PERSONNEL PRECLUDE THE CONTINUITY OF EXPERIENCE WITH THE EQUIPMENT AND THE RESERVE PROGRAM THAT IS NECESSARY TO MAKE IT ALL WORK. THE NAVY IMPLEMENTATION REPORT ON THE CONGRESSIONALLY DIRECTED NRF SHIP INTRODUCTION PLAN IS OVERDUE, CONSEQUENTLY, IT IS NOT KNOW WHETHER ANY CONFLICTS STILL EXIST BETWEEN THE TWO PLANS.

LAST YEAR, NRA COMMENTED ON THE TREMENDOUS NUMBER OF ADDITIONAL PERSONNEL THAT WOULD BE REQUIRED TO MAN THE 600-SHIP NAVY. WE STATED THAT IS WAS POSSIBLE THAT ONE OF THE BATTLESHIPS COULD BE DESIGNATED AS AN NRF SHIP AND BE ASSIGNED A RESERVE CREW. WHEN THE NAVY SOLICITED FOR VOLUNTEERS FOR THE FIRST BATTLESHIP TO BE RETURNED TO ACTIVE SERVICE, MANY RESERVISTS OFFERED TO COME BACK ON ACTIVE DUTY AND SERVE. VERY FEW RESERVE VOLUNTEERS WERE ACCEPTED FOR DUTY ON NEW JERSEY. HOWEVER, ADM HAYWARD INTERCEDED AND DIRECTED THAT QUALIFIED RESERVISTS AND NAVY VETERANS BE GIVEN PRIORITY IN MANNING IOWA, THE NEXT BATTLEWAGON TO COME ON THE LINE. NRA BELIEVES THE RESERVISTS ARE VERY WILLING TO SERVE IF THE NEED IS APPARENT AND THE HARDWARE IS APPROPRIATE TO THE TASK. HISTORICALLY, THERE HAS BEEN VERY LITTLE RESISTANCE BY RESERVISTS TO RECALLS PROVIDED THERE WAS A JOB TO BE DONE. ON THE OTHER SIDE OF THE COIN THERE HAVE BEEN SOME VERY UNHAPPY RECALLEES WHEN THEY WERE NOT USED PROPERLY.

IT IS VERY IMPORTANT THAT THE CONGRESS INSIST ON THE NAVY PROVIDING THE MOST ECONOMICAL WAY OF SUCCESSFULLY FULFILLING A WARTIME MISSION REQUIREMENT. THERE HAS TO BE A CONTINUING DIALOGUE BETWEEN CAPITOL HILL AND THE NAVY TO REACH AN AGREEMENT ON HOW BEST TO FILL THE REQUIREMENTS -- WHETHER BY ACTIVES, RESERVES OR A COMBINATION OF THE TWO. THE CONGRESS MUST ALSO BE RESPONSIVE TO SUPPLY THE MEANS TO DO THE JOB ONCE THE DECISION IS MADE, I.E., RECRUITING/ RETENTION INCENTIVES, MODERN HARDWARE, APPROPRIATE BENEFITS, ETC. THE BENEFITS AND INCENTIVES ARE PARTICULARLY IMPORTANT AS LONG AS WE RETAIN THE ALL-VOLUNTEER FORCE POLICY. MANY OF THESE CONSIDERATIONS BECOME NON-ISSUES WITH A RETURN TO THE DRAFT.

ONE OF THE CONSIDERATIONS WHICH WOULD HAVE TO BE ADDRESSED WHEN DECIDING WHERE TASKS SHOULD BE ASSIGNED IS THE NAVY DEPLOYMENT SCHEDULE. IS IT NECESSARY FOR THE U.S. TO DEPLOY SO MANY UNITS TO SO MANY PLACES FOR SUCH LONG PERIODS?

WHY CAN'T WE LEAVE MORE UNITS OVERSEAS BETWEEN OVERHAULS OR YARD AVAILABILITY PERIODS AND FLY RELIEF CREWS BACK AND FORTH? THE ONE-UP TWO-BACK COSTS A LOT OF TIME AND FUEL OIL IN TRANSITING BACK AND FORTH ACROSS OCEANS. A MODIFIED OVERSEAS HOMEPORTING POLICY MENTIONED ABOVE WOULD ALSO ALLOW SAILORS TO SPEND MORE TIME STATESIDE WITH THEIR FAMILIES. THESE THOUGHTS ARE JUST SOME OF THE IDEAS WHICH SHOULD BE EXPLORED TOGETHER BY CONGRESS AND THE NAVY.

ANOTHER OF THE ITEMS OF CONGRESSIONAL GUIDANCE WHICH THE NAVY IS HAVING TROUBLE ACCEPTING IS THE OPERATIONAL CONTROL OF THE SHIPS BY THE CHIEF OF NAVAL RESERVE, INCLUDING, ADMINISTRATIVE, MANAGEMENT AND FIDUCIARY CONTROL OF HIS FORCES LIKE THOSE OF THE CHIEFS OF MOST OF THE OTHER RESERVE COMPONENTS. NRA BELIEVES THESE CONTROLS ARE NECESSARY TO THE POSITION AND SUPPORTS THE CONGRESSIONAL GUIDANCE CONCERNING OPERATIONAL CONTROL OF THE NRF BY THE CHIEF OF NAVAL RESERVE.

ANOTHER POSSIBLE SOLUTION FOR CONVOY PROTECTION IS THE ARAPAHO PROGRAM, A CONCEPT WHICH PLACES ASW HELICOPTERS ON BOARD MERCHANT SHIPS. ARAPAHO IS A SELF-CONTAINED DEFENSE FORCE LOW IN COST, HIGHLY FLEXIBLE, AND COMPATIBLE WITH AN INTERNATIONAL MIX OF SHIPS. IT UTILIZES EXISTING ASSETS SO THERE IS NO "BETTING ON THE COME" WAITING FOR MORE ADVANCED TECHNOLOGY. THE CONCEPT IS CAPABLE OF ADAPTING TO MISSIONS OTHER THAN JUST CONVOY PROTECTION SUCH AS MINE COUNTERMEASURES, CLOSE AIR SUPPORT WITH EITHER HELICOPTER GUNSHIPS OR HARRIERS, CONVOY SUPPLY SUPPORT, ETC.

BRIEFLY, ARAPAHO IS A CONCEPT WHICH POSITIONS SPECIALIZED CONTAINERS ABOARD MERCHANT VESSELS (CONTAINER SHIPS) TO FORM A HANGER, FLIGHT DECK, WORK SPACES AND LIVING ACCOMODATIONS FOR THE DETACHMENT PERSONNEL. THE PACKAGE IS DESIGNED TO BE COMPLETELY SELF-SUFFICIENT. THE CONTAINERS ARE SPECIALLY OUTFITTED TO FULFILL THE NECESSARY FUNCTIONS OF FLIGHT CONTROL, MAINTENANCE, FIREFIGHTING, SLEEPING, ETC. THEY (THE CONTAINERS) ARE BUILT ACCORDING TO INTERNATIONAL STANDARDS. THE CONTAINERS CAN BE LOADED OR UNLOADED FROM THE HOST SHIPS BY NORMAL AVAILABLE CREWS USING STANDARD LOADING/ UNLOADING EQUIPMENT. THE ASW HELICOPTERS COULD EASILY BE NAVAL RESERVE AS COULD THE TOTAL ARAPAHO MISSION.

NRA HAS ENDORSED AND SUPPORTED THE "ARAPAHO" PROGRAM FOR YEARS AS A POSSIBLE LOW COST ANSWER TO ASW PROTECTION FOR CONVOYS OR OTHER HIGH VALUE TARGETS TRANSITING THE SEA LANES IN SUPPORT OF OUR DEPLOYED FORCES IN WARTIME. THE

PROGRAM AT ONE TIME, KNOWN AS THE RESERVE MERCHANT SHIP DEFENSE SYSTEM (RMSDS), HAS MOVED ALONG WITH AGONIZINGLY SLOW PROGRESS SINCE IT WAS CONCEIVED AT LEAST TEN YEARS AGO. MUCH OF THE PROBLEM CAN PROBABLY BE ATTRIBUTED TO LOW COST AND THEREFORE THE LOW PRIORITY OF THE PROJECT.

THE UPDATE ON ARAPAHO BY MR. MULQUIN IN THE FEBRUARY 1982 ISSUE OF THE NRA NEWS WAS AN UPBEAT REPORT BY AN INDIVIDUAL EXTREMELY KNOWLEDGEABLE AND CLOSE TO HIS SUBJECT. IT IS OBVIOUS BY READING MR. MULQUIN'S ARTICLE THAT THE ARAPAHO PROGRAM WITH ITS TREMENDOUS POTENTIAL OF PROVIDING A LOW COST ANSWER TO A SUPPLEMENTAL ASW COVERAGE OF THE SEA LANES, DESERVES A THOROUGH TESTING AND EVALUATION.

THE CONGRESS HAS BEEN MORE THAN PATIENT WITH THE SLOW PROGRESS BEING MADE ON THE PROJECT. MOST OF THE GUIDANCE FOR CONDUCTING THE TESTS AND EVALUATION HAS BEEN CONGRESSIONALLY INSPIRED AND THE FUNDS HAVE BEEN ADD-ONS FROM CAPITOL HILL.

LAST YEAR THE CNO TESTIFIED THAT IT WOULD TAKE APPOXIMATELY $12 MILLION OVER A THREE YEAR PERIOD TO COMPLETE THE PROJECT. THE BRITISH, CANADIANS, AUSTRALIANS, AND GERMANS ARE VERY INTERESTED IN THE CONCEPT. THE BRITISH, IN FACT, HAVE TAKEN AN ACTIVE PART IN THE TESTS AND EVALUATIONS. THE COMMANDANT OF THE MARINE CORPS HAS EXPRESSED AN INTEREST IN TESTING THE SUITABILITY OF THE PLATFORM FOR DEPLOYING HARRIERS AT SEA. IT WOULD APPEAR FROM EVEN A CASUAL OBSERVATION THAT IT WOULD BE NEGLIGENCE ON THE PART OF OUR PLANNERS NOT TO FULLY EVALUATE THE ARAPAHO CONCEPT.

NRA BELIEVES THAT THE TEST AND EVALUATION PHASE OF THE PROJECT SHOULD BE EXPEDITIOUSLY CONDUCTED AND THE RESULTS TABULATED TO DETERMINE THE FEASIBILITY OF A FOLLOW-ON IMPLEMENTATION PROGRAM. THE TESTS SHOULD UTILIZE CIVILIAN, UNITED KINGDOM AND NAVAL RESERVE ASSETS TO PRECLUDE, AS MUCH AS POSSIBLE, THE INTERRUPTION OR CANCELLATION OF THE ACTIVE FORCE SHIPS' SCHEDULES.

RECOMMENDATIONS:

THE NAVAL RESERVE ASSOCIATION STRONGLY URGES THE COMMITTEE TO ACCOMPLISH THE FOLLOWING ACTIONS:

o INSIST THAT THE NAVY FOLLOW THE PREVIOUS CONGRESSIONAL DIRECTION concerning Operational Control of the NRF ships by CNAVRES and full manning of the NRF ship active duty crews by TAR personnel.

- Fund $4.0 Million to continue Phase II, of the Tactical and Operational Testing of ARAPAHO.

Guard/Reserve Procurement Account

Mr. Chairman, one of the most desirable and effective actions which could be taken by this Committee would be to establish separate Guard and Reserve Procurement Accounts. The Financial Summary released by OSD for Fiscal Year 1983 is a graphic illustration of how deceiving and misleading a group of figures can be. The Financial Summary Document showed an increase in Guard and Reserve funding from $12.3 Billion in FY 1982 to $14.3 Billion in FY 1983, an increase of over $2.0 Billion in constant FY 1983 dollars.

An analysis revealed that there are factors which change the perception given by that summary considerably. First, a significant portion of the money, approximately 30%, which OSD claims is or was used for the Guard and Reserve equipment procurement is actually used for active force procurement. If we would believe the chart then we would assume that Guard and Reserve units are receiving considerable amounts of new equipment. We know however, that is not true, the units are receiving hand-me-down hardware. The Army is the main culprit in this con game and from personal experience you can be assured that there is no way to establish an audit trail which would logically commence with Appropriations and end with the equipment in the hands of the Guard and Reserve.

After adjustments are made to reflect what the Guard and Reserve really costs, the following chart, which shows constant FY 1983 dollars, compares the claimed versus the real cost of the Guard and Reserve Forces.

	FY 1981	FY 1982	FY 1983		Change FY 82-83
OSD	11.4	12.3	14.3	+	2.1
Actual	8.71	8.98	9.64	+	.66

The shortage of Guard and Reserve equipment is estimated at $2.64 Billion by the Senate Armed Services Committee based upon reports from the Chiefs of the National Guard and Reserve components. This was the first report of such equipment shortages and is believed to be considerably below the actual shortage.

It appears that the Congress is serious about rectifying the G/R equipment shrotages but the only way that the money appropriated will end up for the purpose intended is to establish separate Procurement accounts for each of the Reserve Components. There is the natural reluctance of the services to lose their flexibility in the Procurement accounts but the decision by the Congress to establish separate Reserve Personnel and Operations and Maintenance accounts almost ten years ago has helped considerably in preventing the diversion of Reserve Component money to active force purposes. The establishment of Guard and Reserve Procurements Accounts would also eliminate the requirement in the SASC report this year that ..."the chiefs should report to the Committee within 60 days of the date of enactment of this Act on the allocations each has made..." since the money appropriated would have to be used for the purpose intended.

In a separate but related issue the Naval Reserve Association is recommending that the Chief of Naval Reserve come from the ranks of the Naval Reserve, appointed by the President for a statutory tour and be responsible for administrative management, operational and fiduciary control of his forces. The establishment of Guard and Reserve Procurement Accounts would help considerably to enable the Naval Reserve Chief to manage his assets and for all the Reserve Component Chiefs to upgrade their forces.

Recommendation

The Naval Reserve Association strongly recommends that this Committee initiate action to establish a Procurement Account for each of the Reserve Components.

Summary

Mr. Chairman, it is obvious from past experience that if this country is ever going to benefit from the expertise and cost-effectiveness of the Guard and Reserve to anywhere near what the potential possibilities are, initiatives will have to continue to come from the Congress. The Services and the Office of the Secretary of Defense all have a deep reluctance to take an objective look at possible additional contributions of the Guard and Reserve to the national defense effort. Even when new or additional tasks are given the Reserve Components the necessary support to do the job is often lacking.

Since the Authorization process has not yet been completed this testimony

HAS NECESSARILY COVERED A BROADER RANGE OF TOPICS THAN WOULD HAVE BEEN DONE HAD THE FY 83 DEFENSE AUTHORIZATION BILL BEEN COMPLETED. ALL OF THE SUBJECTS INCLUDED IN THIS TESTIMONY WERE INCLUDED IN ONE OR BOTH OF THE PRESENT DEFENSE AUTHORIZATION BILLS.

ALL OF THE ISSUES DISCUSSED IN TODAY'S TESTIMONY ARE OF VITAL INTEREST TO THE DEFENSE OF THIS NATION, AND COULD PUT THE NAVAL RESERVE BACK ON THE ROAD TO PROVIDING THIS COUNTRY WITH A HIGHLY EFFICIENT, COST EFFECTIVE FORCE. THE MEASURES PROPOSED WOULD PROVIDE ALMOST IMMEDIATE AND SUBSTANTIVE IMPROVEMENT IN COMBAT READINESS.

- o THE RECOMMENDATION TO INCREASE THE NAVAL RESERVE STRENGTH PROPOSES A GRADUAL INCREASE OVER A FOUR YEAR PERIOD TO A LEVEL ALL PARTIES NOW GENERALLY AGREE TO BE THE WARTIME REQUIREMENT.
- o THE TAC/NAV MOD TO THE RESERVE P-3A/B AIRCRAFT WILL PROVIDE A QUANTUM INCREASE IN ASW CAPABILITY TO THE MODIFIED AIRCRAFT FOR A SMALL FRACTION OF WHICH A NEW AIRCRAFT WOULD COST. THE RESERVE P-3 UNITS ARE PRIME CANDIDATES FOR EARLY RECALL IN THE CASE OF INCREASED WORLD TENSION.
- o THE C-9 PROCUREMENT PROPOSAL ADDRESSES AN IMMEDIATE ANSWER TO A CRITICAL SHORTAGE OF TACTICAL AIRLIFT IN THE NAVY. DRILL ATTENDANCE FROM AIRLIFT PICKUPS POINTS IS SUFFERING CONSIDERABLY BECAUSE THE OLD C-118S CANNOT MAKE THE SCHEDULE ANY MORE. THE NRA PROPOSAL TO LEASE/BUY USED DC-9S PROVIDES AN INSTANT ANSWER FOR A LONG TERM AT LOW COST.
- o NRA ASKS FOR THE CONTINUED SUPPORT FROM THIS COMMITTEE TO PROVIDE A CREDIBLE NAVAL RESERVE SURFACE FORCE BASED UPON GUIDANCE GIVEN THE NAVY OVER THE PAST SEVERAL YEARS. THE SUPPORT TO COMPLETE THE PHASE II TESTING OF ARAPAHO IS ALSO REQUESTED BECAUSE OF THE GREAT POTENTIAL AND POSSIBLE ADAPTABILITY FOR SEVERAL MISSIONS BY THE CONCEPT. ALSO ATTRACTIVE IS THE COST VERSUS CAPABILITY RATIO.
- o PROBABLY ONE OF THE GREATEST STRIDES WHICH COULD BE MADE IN THE EFFORT TO PROPERLY EQUIP THE GUARD AND RESERVE WOULD BE FOR THE COMMITTEE TO INITIATE A PROCUREMENT ACCOUNT FOR EACH OF THE RESERVE COMPONENTS. THE ABILITY TO ACCOUNT FOR THE TRUE COSTS OF ACTIVE AND RESERVE FORCES WOULD BE IMPROVED CONSIDERABLY AND THE G/R WOULD RECEIVE THE EQUIPMENT INTENDED FOR THEM BY THE CONGRESS.

Mr. Chairman, the American public will probably continue to support the much needed build-up in the military posture if it can see that everyone in the Legislative and Executive branches are doing their part to improve combat effectiveness at the lowest possible cost. The Naval Reserve Association strongly believes this can be best accomplished by greater use of the Guard and Reserve in Defense planning. This is particularly true in the Navy. The Naval Reserve Community has the experience, the desire and the potential to assume a significantly greater role in the total Navy structure at much less cost than is presently projected.

Mr. Chairman, the Naval Reserve Association appreciates the support you and your Committee have given the Naval Reserve and looks forward to a continuing cooperative effort to provide this country with a Guard and Reserve capable of stepping into the breech when they are needed in a (possible) conflict. For the most part, the capability is there if the support is provided. When the Reserve Components have been manned and equipped and then have been called, they have performed admirably in combat and in combat support roles. Mr. Chairman, Congressional support for the Guard and Reserve will be repaid many times in cost effective wartime capable assets.

Thank you, Mr. Chairman.

Facts - Naval Reserve Strength

1. The Administration proposes to fund 94,000 Selected Naval Reservists in FY 1983.
2. Naval Reserve strength has been a controversial issue since early 1970's.
3. Decline of NR strength went from 129,000 in FY 1973 to a low of 87,000 in Fiscal Years 1978 through 1981. Congressional action stopped decline and increased strength to 94,000 for FY 1982.
4. Recent history of Selected NR average strength:

FY	Navy Submission	President's Budget	Congressional Authorized	Congressional Funding
73	129,000	129,000	129,000	129,000
74	129,000	116,981	119,231	116,857
75	112,819	107,526	117,000	108,485
76	95,142	93,982	106,000	99,000
TQ	92,000	92,000	106,000	101,400
77	92,762	52,000	96,500	96,500
78	96,500	52,000	87,000	87,000
79	87,000	51,400	87,000	87,000
80	87,000	48,700	87,000	87,000
81	87,000	87,000	87,000	92,000 (1)
82	87,000	87,000	87,000 (2)	94,000
83	94,000	94,000		

(1) Funds diverted by OSD and strength retained at 87,000.
(2) 90,000 strength recommended by HASC but deleted in authorization conference.

5. Studies during past decade all recommended much higher strength than OSD analysts would accept:

Study	Date	Conducted by	Selected Reserve Strength Recommended
Total Force	1973-74	OSD	92,000
OP 605	1974-75	Navy	102,000
Navy Mission Study	1976-77	OSD	95,900
Guard and Reserve (ROGAR II)	1977-78	OSD	110,000*
Navy Manpower Mobilization System (NAMMOS)	1978-ongoing	Navy/OSD	122,760**

*Recommended 10% additional manning to ensure full wartime availability.
**NAMMOS stated requirements increase from 113,406 in FY 1983 to 122,760 in FY 1987.

6. OSD, in FY 1981, defied Congress by refusing to use appropriated funds to raise NR strength to 92,000 (Note 1).

7. NR is the only immediate source of trained personnel to augment the active Navy in the event of war, national emergency or for other contingencies such as the call up of 100,000 Selected Reservists by the President.

8. Navy shortage of critical skills to man fleet ships could be at least partially offset by designating Naval Reservists to fill shortages.

9. Proposed expansion of Navy to 600 ships will increase need for additional Naval Selected Reservists to augment the new ships.

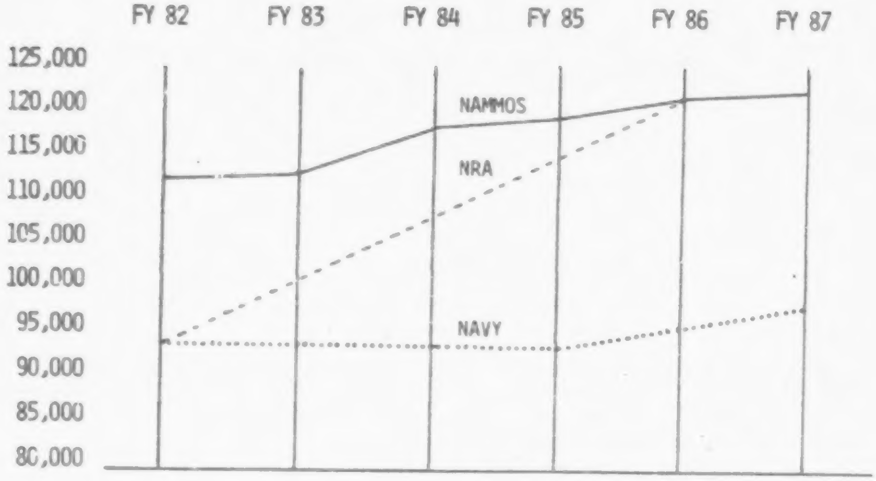
10. Naval Reserve recruiting capability has not been tested since strength declines commenced in FY 1974. Gradual climb to NAMMOS numbers appears feasible.

11. Maximum utilization of Reserve assets will provide expanded defense posture with top notch caliber personnel at lowest possible cost.

12. The planning criteria should be that: All mobilization missions not capable of being performed by the Naval Reserve should be in the active Navy. This would result in significantly larger Naval Reserve.

13. Gradual buildup of NR strength must continue if wartime mobilization goals are to be met in OSD time constraints (end FY 86).

14. The following graph illustrates NAMMOS, Navy Plan and NRA proposed for increased NR strength:



	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87
NAMMOS	112,400	113,400	117,398	118,925	120,931	121,187
NAVY	94,000	94,000	94,000	94,000	95,400	98,650
NRA	94,000	100,750	107,500	114,250	121,000	121,187

15. RECOMMENDATION:

THE NAVAL RESERVE ASSOCIATION STRONGLY RECOMMENDS THAT THE CONGRESS FUND FOR A 100,750 NAVAL RESERVE DRILLING END STRENGTH FOR FY 1983 AS PART OF A GRADUAL INCREASE IN NAVAL SELECTED RESERVE STRENGTH TO THE NAMMOS FIGURE TO BE REACHED BY END OF FY 1986. (AVERAGE DRILL STRENGTH 97,375). THE ADDITIONAL COST OVER THE BUDGET FOR FY 1983 IS $11.8 MILLION.

FACTS - P-3A/B TAC/NAV MODERNIZATION

1. SOVIET SUBMARINE FORCE (ATTACK & STRATEGIC) IS GREATEST THREAT TO OUR NATION'S SURVIVABILITY - THREAT IS INCREASING.
2. DEFENSE PLANNERS MUST PROVIDE MAXIMUM FEASIBLE COUNTER TO SOVIET UNDERSEAS THREAT.
3. TACTICAL/NAVIGATION MODERNIZATION (TAC/NAVMOD) PROVIDES P-3A/B AIRCRAFT WITH NEAR BASELINE P-3C CAPABILITY.
4. TAC/NAVMOD PROVIDES MAJOR IMPROVEMENTS IN CRITICAL AREAS OF TACTICS, GEOGRAPHIC NAVIGATION, TACTICAL DISPLAY, DATA MANAGEMENT, RELIABILITY MAINTENANCE, CREW WORKLOAD AND SYSTEM INTEGRITY.
5. ASW CAPABILITY OF MODERNIZED AIRCRAFT IS 75% IMPROVED OVER UNMODIFIED.
6. OPEN-OCEAN ASW CAPABILITY OF UNMODIFIED AIRCRAFT UNRELIABLE.
7. FAILURE TO PROVIDE MODERNIZATION WOULD CONSTITUTE PLANNED OBSOLESCENCE.
8. RESERVE P-3 SQUADRONS WOULD MOST LIKELY BE RECALLED EARLY IN HEIGHTENED WORLD TENSION SITUATION TO BE DEPLOYED AROUND THE WORLD.
9. P-3A/B MODERNIZATION PROVIDES HIGHEST IMPROVEMENT IN CAPABILITY FOR LOWEST DOLLAR COST OF ANY DEFENSE PROGRAM.
10. MULTI-YEAR PROCUREMENT FOR A TWO YEAR BUY-OUT FOR THE REMAINING 71 NAVAL NAVAL RESERVE P-3A/B'S WOULD COMPLETE MOD PROGRAM AND PROVIDE COST SAVINGS OF APPROXIMATELY 10%-15% OVER SEPARATE YEAR PURCHASES.
11. PRESENT NAVY CAPABILITY TO INSTALL MOD KITS IS 36/YEAR.
12. PROPOSED PLAN:

Reserve P-3A/B TAC/NAV MOD

	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984
Kits procured	14	0	34	15		
Procurement Required (Cost)*					36 ($50.4M)	35 ($49.0M)
Unmodified Aircraft	120	120	86	71	35	-0-

*Based on multi-year procurement

13. Cost for FY 83 would be $50.4 Million over budgeted request based upon two year, (FY83 and FY84) multi-year procurement.

14. Recommendation: That the Congress fund the modernization of 71 Naval Reserve P-3A/B aircraft, 36 in FY83 for $50.4 Million and 35 in FY84 for $49.0 Million, in a multi-year procurement thus providing the taxpayer with a quantum jump in protection for a minimum cost.

FACTS - NAVY AIRLIFT MODERNIZATION

1. Airlift consolidation under MAC has been accomplished to the maximum by Navy. Air Force agrees that the remaining 20% is unique to the needs of the Navy and should be satisfied by Navy Organic Airlift.

2. Navy unique airlift needs are characterized by

   Short lead time,
   low volume, and
   high frequency

   of demands to a multiplicity of unpredictable fleet locations for satisfaction of urgent requirements.

3. Congressional hearings consistently have resulted in support for Navy intra-theater airlift modernization.

4. A portion of the requirement is being satisfied by antique C-118 aircraft which are being phased out with no replacement available except the present C-9 fleet. Just to maintain the status quo, a significant C-9 procurement program is required.

5. Defense Tactical Airlift Modernization (DODTAM) Study conducted by OSD (January-July 1978), confirmed the need for 37 additional C-9Bs.

6. Three new C-9Bs were added to the budget in the last four years.

7. Used DC-9 aircraft were added to the budget in FY 82 by the Armed Services Committees but were dropped out in Conference.

8. Immediate, responsive, wartime airlift to fleet commanders around the world is imperative. A modest Navy organic airlift capability has been clearly shown to be the only method of providing the requisite response. Capability utilized fully in peacetime to provide required readiness training and airlift for Fleet and Reserve support.

9. Procurement of C-9B/DC-9 is the lowest cost option to satisfy unique Navy intra-theater needs. All other requirements satisfied by MAC or MTMC.

10. C-9B has best dispatch reliability rate (97+% in CONUS) of any operational aircraft in the military inventory.

11. C-9B airlift is operated by the Naval Reserve for the entire Navy - Active and Weekend Warrior.

12. Peacetime organic airlift is vital to the readiness of the Naval Reserve Force. Transportation to training platforms from drill sites necessary for hands-on readiness training.

13. Quick responsive airlift for active and reserve Navy personnel shows personnel Navy cares for their well being. Very important recruiting/retention tool.

14. LEASE/BUY of used DC-9s most expeditious and economical way of solving immediate Navy airlift needs and retaining trained personnel.

BUY Used DC-9s (8/FY 83, 4/FY 84)

Fiscal Year	FY-83	FY-84	FY-85
Flyaway Cost	(8) 50.0	(4) 25.0	(0) -
Site Support(*)	8.0	2.5	-
Spares (Initial(*)	16.0	8.0	-
O&MNR (POL)	14.3	19.0	19.0
O&MNR (Maintenance)	4.7	6.2	6.2
O&MNR (Training)**	.8	-	-
Sub Total	93.8	60.7	25.2
Less FY 83 Budget Procurement	(16.2)		
Less FY 83 C-118 O&MNR (1/2 Year)	(4.1)		
Total	73.5***		

(Procurement 57.8 O&MNR 15.7)***

LEASE 12 Used DC-9s

Fiscal Year	FY-83	FY-84	FY-85
Lease (O&MNR)	12.0	12.0	12.0
Site Support	11.4	-	-
Spares (Initial)	21.0	-	-
O&MNR (POL)	14.3	14.3	14.3
O&MNR (Maintenance)	4.7	4.7	4.7
O&MNR (Training)	.8	-	-
Sub Total	64.2	31.0	31.0
Less FY 83 Budget Procurement	(16.2)		
Less FY 83 C-118 O&MNR	(4.1)		
Total	43.9***		

(Procurement 16.2 O&MNR 27.7)***

*Costs based upon unknown offer of used DC-9-31 aircraft which includes much site support and spare parts.
**Training costs for 64 pilots and 22 enlisted crew.
*** Over budget requests.

15. Offsetting costs in FY 83 budget are $16.2M in Procurement and $4.1M in O&MNR.

Recommend - Purchase eight (8) used DC-9s at the cost of $73.5 Million over budget in FY 1983 (includes Procurement and O&MNR).

CAPTAIN JOHN H. BELL, USNR (RET)

CAPTAIN BELL IS A LIFE MEMBER AND CONSULTANT TO THE NAVAL RESERVE ASSOCIATION.

BORN IN SIOUX FALLS, SOUTH DAKOTA, MAY 5, 1924, HE ATTENDED SCHOOL THERE AND AT THE UNIVERSITY OF MIAMI, FLORIDA. HE ENLISTED IN THE U.S. NAVY AS A NAV CAD IN DECEMBER 1942 AND WAS COMMISSIONED AN ENSIGN ON APRIL 15, 1944 AS A NAVAL AVIATOR.

CAPTAIN BELL SERVED IN FIGHTER, NIGHT FIGHTER, SPECIAL WEAPONS, HELICOPTER AND ANTI-SUBMARINE WARFARE UNITS. HE COMMISSIONED AND WAS THE FIRST COMMANDING OFFICER OF AIR ANTI-SUBMARINE SQUADRON TWENTY NINE (VS-29).

HE SERVED ON ACTIVE DUTY FOR OVER 31 YEARS, 22 OF THOSE YEARS AS A TAR OFFICER. HE WAS RELEASED FROM ACTIVE DUTY TWICE AND TWICE RECALLED FOR THE BERLIN CRISIS AND KOREA. CAPT BELL SERVED AS A SELECTED RESERVIST DURING HIS TWO YEARS OF INACTIVE DUTY.

HIS LAST TOURS OF ACTIVE DUTY BEFORE RETIRING IN JANUARY 1976 WERE AS FOLLOWS:

- OFFICER IN CHARGE - RESERVE ASW TACTICAL SCHOOL, WILLOW GROVE, PA.
- COMMANDING OFFICER - NAVAL AIR RESERVE TRAINING UNIT, NORFOLK, VA.
- RESERVE LIAISON OFFICER FOR OPERATIONS, PLANS & TRAINING, COMMANDER NAVAL AIR FORCES ATLANTIC FLEET, NORFOLK, VA.
- ACTING DIRECTOR RESERVE PLANS PROGRAMS & BUDGET AND AS THE DIRECTOR RESERVE READINESS & MOBILIZATION, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (RESERVE AFFAIRS).
(UNDER THE HONORABLE TED MARRS AND WILL HILL TANKERSLEY).

CAPTAIN BELL IS MARRIED TO FORMER MARGARET MARY COGLEY OF SIOUX FALLS, SOUTH DAKOTA. CAPTAIN AND MRS. BELL RESIDE IN THEIR RETIREMENT HOME AT LONG LANE FARM LOCATED ON THE EAST RIVER IN BOHANNON, MATHEWS COUNTY, VIRGINIA.

GEORGETOWN UNIVERSITY

STATEMENT OF REV. T. BYRON COLLINS, S.J., GEORGETOWN UNIVERSITY

ACCOMPANIED BY:

MARY S. ALBERT, OFFICE OF THE CHANCELLOR, MEDICAL CENTER

L. DEAN PRICE, UNIVERSITY ARCHITECT

MEDICAL EFFORT AND ENERGY PROGRAM

Senator RUDMAN. The final witness of the morning is Rev. T. Byron Collins of Georgetown University.

Welcome Reverend Collins.

Reverend COLLINS. Thank you, Senator.

With me is Mary Albert from the chancellor's office of our medical center and Dean Price, the university architect in case you have any questions.

There are three very brief points I would like to cover. Two of them involve our medical effort and the third one is one that involves an energy program.

In the medical effort we would like to urge that the committee continue its support for the Armed Forces health service scholarship program. Georgetown for years has participated in this and our enrollment in this particular program has dropped not because of a lack of interest or applicants of our students, but because the program has grown across the Nation in applications for the slots from many medical schools, and that is primarily because of the drop in the National Health Service Corps. This is good for the health services in the Armed Forces.

On that particular point there is quite a shortfall in the Reserve for doctors and also for nurses. We would be willing and anxious on behalf of the medical centers in the District to undertake a pilot program for providing a Reserve contingency or a Reserve Corps of young men and women in the Medical Corps.

There is quite a published need by the Defense Department of Reserve officers, Reserve doctors. Under the present law in case of an emergency there cannot be, unless the law is changed, which it could be, a program for having additional young men and women available for service as doctors.

The second point concerns biomedical research. The program, we support the request of the President at $168 million. Georgetown has some capabilities in this which is in our testimony.

The third point concerns a problem that affects all the services, but we have done quite a bit of work with the Army on a program for a fuel cell. Our testimony shows that Georgetown in its history has done some innovative things in the field of energy—energy production. An Army base is very similar to a university, the same sort of requirements. For young men and women to live, you have to heat them, keep them cool in the warm weather, and provide electricity.

FUEL CELL

The fuel cell, we have been doing a great deal of work on this, is like a large battery. It produces electricity and heat. We worked with the Army Corps of Engineers and noticed that they have listed 40 sites that they would like to have corrected in changing from oil to coal.

We believe that with some planning money, which is what we are asking for, we are asking for funds to do an exemplar planning program. The exemplar planning program would have as its purpose to investigate a financial plan that would provide fuel cells with three participating elements, the local utility company, university resources, which would attract private resources, and the Army.

The capability of using a fuel cell now is that it is very expensive. Our particular proposal says that with investigation planning for two sites we would suggest that the Army would select one and we would suggest the other one to be at Georgetown because we have spent a great of money already on the planning for it.

The purpose of this plan would be that if a fuel cell is produced for two sites with the cost being shared in these first two sites by the university, by the local utility company and by the Army, that in the next two the costs drop dramatically. In the third set of two the Army would be able to have its fuel cells, if the study proves out, at no cost. The cost would be provided by the local utility and investors.

The amount of money we are asking for to sort of bring to conclusion, and $800,000 we have spent so far, is a request for $350,000. We would like the committee's support of this. So fundamentally our program would be to investigate the economics of a plan that would have three sources of funding for a fuel cell in those places where a fuel cell is economic to provide electricity and heat. You would provide hot water which is much more effective than steam.

The purpose of it would be to have the funding mechanism put in place of the university resource, the public utility's resource, and all of this we have researched and found that it is feasible under the law, and the third would be a contribution from specifically the Army, because they are the ones that seem to have the largest problem.

We have had a good track record in this in our exemplar program. Needless to say, it would be a great benefit to the universities also, because once it gets to that stage not only would the Army benefit from it but 750 universities in the United States have the same problem where our electric bill has gone from $1 million to $3 million in about 2½ years.

[The prepared statement of Reverend Collins follows:]

PREPARED STATEMENT OF T. BYRON COLLINS, S.J.

SPECIAL ASSISTANT TO THE PRESIDENT

GEORGETOWN UNIVERSITY

Mr. Chairman, Members of the Subcommittee:

I am T. Byron Collins, S.J., Special Assistant to the President of Georgetown University. I am accompanied today by L. Dean Price, University Architect, and Ms. Mary S. Albert from the Office of the Chancellor of the Medical Center. We appreciate very much the opportunity to testify before you today.

There are three issues which we would like to discuss with you today.

1. The Armed Forces Health Professions Scholarship Program (AFHPSP), a very successful program for young health professionals who perform a service payback in the military upon completion of their education.
2. Biomedical research of the DOD with specific emphasis on the University research network.
3. A joint Georgetown-Army project for fuel cell energy cogenerations, part of a National Exemplar energy demonstration project which will develop a new and highly efficient energy source to the point where it is cost-effective for both military installations and universities in the United States.

1. Armed Forces Health Professions Scholarship Program (AFHPSP):

We urge continued support of the approximately 5,000 scholarships of the Armed Forces Health Professions Scholarship Program. In this program, young people (primarily medical students) apply for service scholarships which provide tuition, a living stipend and other educational costs. In return, the student, upon completion of his/her education fulfills a service payback for each year of scholarship support (with a minimum of two years payback).

We have always strongly supported this program which provides the services with their required cadre of physicians, as less cost than the Uniformed Services University of the Health Sciences (USUHS). We have many Georgetown students in the program, including Georgetown graduates completing their post M.D. training and graduates already engaged in service payback who plan on a career in the military.

We are delighted for the services that the program has become so competitive (with 6-8 applicants for the approximately 1,500 new places each year) and we are confident our Georgetown applicants can meet the high competitive standards of the program. We urge continuation of the scholarship program at its present level.

We understand that there continues to be a problem of an insufficient number of reserve medical officers. We urge the subcommittee to request the DOD to investigate and initiate, on a pilot basis, a modified version of the AFHPSP scholarship program which would supply reserve military officers. For lesser scholarship benefits, the DOD would seek a reserve commitment from the student.

Such a program would be attractive to students and guarantee a supply of needed personnel. We at Georgetown would be delighted to participate in a pilot program and suggest that a group of universities, such as the three medical centers in Washington, D.C., would form a promising pilot group.

An additional item relating to the scholarship program we would like to highlight for the subcommittee is the unfortunate recommendation of the

Department of Health and Human Services that the stipend for the National Health Service Corps (NHSC) Scholarship be drastically reduced by more than one-half in FY 1983, (i.e. in the academic year 1983-4) to a little more than $3,000.

By law, AFHPSP stipend are tied to the NHSC Scholarship stipend level. We reject this economy as there is no way NHSC or AFHPSP students can support themselves on the reduced stipend. We regard the proposed cut as a breach of good faith with those already in the program, particularly those in the AFHPSP, who have received their military commission and cannot withdraw from the program. We urge the subcommittee to urge restoration of full funds of the NHSC stipend, which will result in full funding of the AFHPSP stipend.

2. Greater University Involvement in DOD Related Biomedical Research:

We urge greater involvement of the University community in the Research and Development of military interest, particularly in biomedical research. For several years we have stated before this subcommittee the enormous benefit which the DOD achieves by grants and contracts with the network of American universities which have expertise in military relevant research.

Mr. Chairman, we are witnessing with dramatic urgency the realization that there are simply not enough resources in our nation to meet the demands for all defense and social programs. We wish to point out to you that as HHS funding for biomedical research levels off (and actually declines in constant dollars) there emerges an underutilized research expertise at American universities which can be readily shifted to research of direct military relevance. With the level of scientific expertise in the United States in relation to other major world powers is being critically evaluated, it seems obvious that increased DOD support of militarily relevant biomedical research will not only result in useful research for the DOD, but will enhance the research base of our American universities.

Although we are only one of the "little fellows", about 20% of our research effort in the Medical Center is defense related. We know our expertise is substantial and varied, and can be easily applied to projects of military value. For example, we believe we are doing and can do still more first rate research on vaccines against infectious diseases endemic / in different parts of the world.

We would welcome the opportunity to apply our talents to more biomedical research of military relevance and urge the subcommittee to request fuller utilization of the extraordinarily rich and varied expertise at American universities. We urge support of biomedical research at least the level of the President's request for $168 million, which is a declining amount in constant dollars.

3. National Exemplar Energy Planning Program:

Georgetown University requests support of the subcommittee for $350,000 for a joint Georgetown-U.S. Army national exemplar energy planning program, specifically, a fuel cell cogeneration commercial demonstration project. We seek to join in a planning program to investigate the feasibility of a fuel cell that could assist the army's program of replacing some 40 oil burning heating plants with coal fired plants, and provide a model for universities in the U.S. who have similar energy problems.

Georgetown University has for seven years implemented a major energy program which includes energy conservation, computerized controls, atmospheric fluidized bed combustion coal boiler, solar photovoltaics, thermal storage, organic rankine cycle systems, electric transportation Intermodal Access System, and finally, fuel cells and methane from sewage fuel production system. The complete system will ultimately be integrated into the "National Exemplar Integrated Socio-Energy Systems (NEISES)".

The fuel cell facility, comprised of three 7-10 MWe fuel cell modules, would be completed in four stages:

1. Economic outline for fuel cell program (paid for by Georgetown from Georgetown University resources; this portion is complete) $ 60,000

2. Integration of Fuel Cell component in megawatt output - results to be used in Georgetown-Army Program. This is underway from Georgetown resources) $ 667,350

3. Site Specific Applications of above for Army and Georgetown, we request from the committee at this time $ 350,000

$1,017,350

4. The detailed planning, design, procurement, installation, startup testing and operational demonstration, would follow, along with an educational and training program which would incorporate hands-on training with the fuel cell and other cogeneration systems as well classroom courses. Funding for this final stage would be requested only if justified by the results from the first three stages, and would be borne by joint funding of military, universities, and private concerns.

We understand from the Assistant Secretary of the Army (Installations, Logistics and Financial Management) that this type of project is within purview of the Assistant Secretary of the Army (Research, Development and Acquisition). We request this Committee to support the exemplar fuel cell program planning.

The Senate in FY 1981 supported proceeding with "promising alternative energy sources, including fuel cells" (attached). The projects cited in the House report that same year refer to projects of a much smaller magnitude (also attached).

We are addressing here, Mr. Chairman, a difference in energy production by a factor of many thousands. Such promising energy potential justifies the most investment of $350,000.

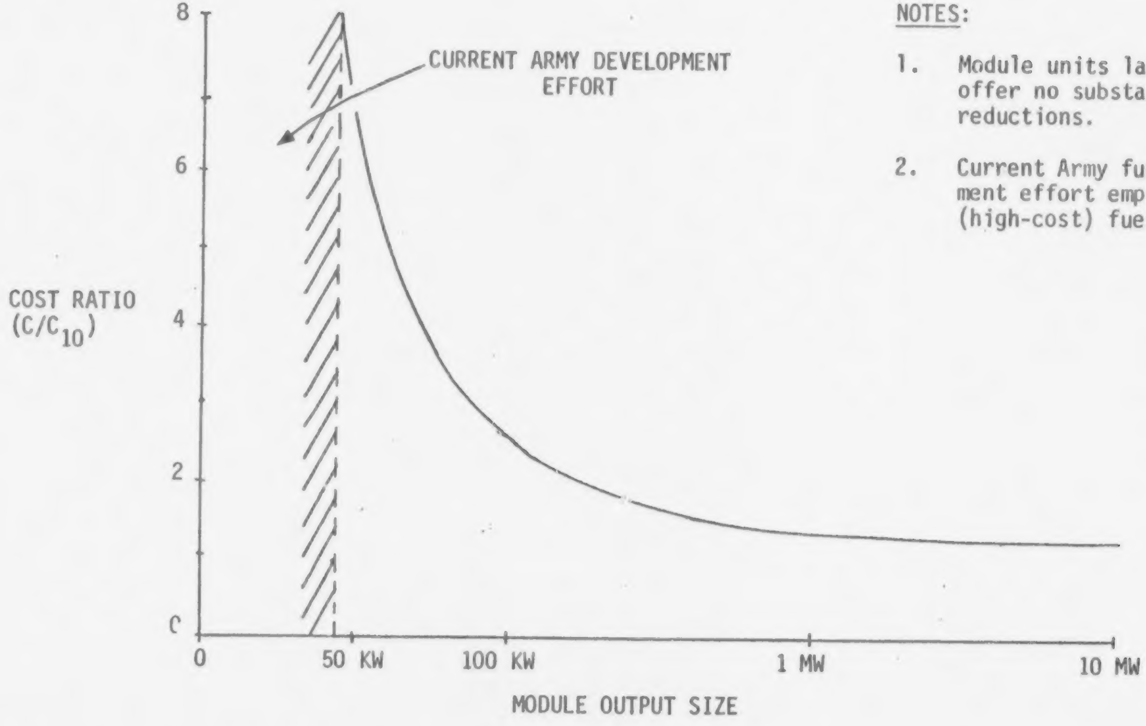
Thank you very much for this opportunity to appear before you. We would be delighted to answer any questions you or your staff may have.

NATIONAL EXEMPLAR ENERGY PLANNING PROGRAM

1.	ECONOMIC OUTLINE FOR FUEL CELL PROGRAM (PAID BY GEORGETOWN UNIVERSITY, NOW COMPLETE)	$ 60,000
2.	INTEGRATION OF FUEL CELL COMPONENT IN MEGAWATT OUTPUT (PAID BY GEORGETOWN UNIVERSITY, UNDERWAY)	667,350
3.	SITE-SPECIFIC APPLICATIONS OF ABOVE FOR ARMY AND GEORGETOWN (REQUESTED/IDENTIFIED)	350,000
	TOTAL PLANNING COST	$1,017,350

NOTE: 75 TO 1 TECHNOLOGY BENEFIT/INVESTMENT RATIO

TYPICAL INDIVIDUAL MODULE
COST RATIO, BY OUTPUT SIZE
(NORMALIZED TO 10 MW OUTPUT)



NOTES:

1. Module units larger than 10 MW offer no substantial cost reductions.
2. Current Army fuel cell development effort emphasizes small (high-cost) fuel cell modules.

Calendar No. 1016

96TH CONGRESS }
2d Session }
SENATE
{ REPORT
{ No. 96-931

MILITARY CONSTRUCTION APPROPRIATION BILL, 1981

SEPTEMBER 9 (legislative day, JUNE 12), 1980.—Ordered to be printed

experimentation, especially where alternative energy programs may be more efficient and economical. Consequently, the Committee directs the Department to be prepared to justify any solar requests submitted with the fiscal year 1982 budget request not only according to both the DOD and DOE criteria but also against other energy programs which may be just as effective.

Alternative energy sources.—The Committee agrees with the House that the Department should proceed with a number of promising alternate energy sources, including fuel cells. The Committee expects the Department to pursue these programs through competitive bidding.

96TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
No. 96-1097

MILITARY CONSTRUCTION APPROPRIATION BILL, 1981

The Department testified this year that, although the number of units operated remains essentially stable, energy consumption for family housing units will actually increase over fiscal year 1980. The Committee feels that energy consumption will continue to increase for family housing units unless a metering program is established by the Department. The Department is directed to submit a plan for family housing metering that can be considered with the fiscal year 1982 request.

Alternate energy sources.—The Committee wants the Department to proceed with the application of alternate energy sources that go beyond the solar program. During this year's hearings the Department of Defense stated that fuel cells at military installations have the following benefits: (1) highly efficient use of scarce energy sources, (2) insignificant environmental effects. (3) flexibility to use a wide spectrum of domestically available fossil fuels and renewable energy sources, (4) low life cycle costs, (5) ability to operate in harsh environments, and (5) efficiency even at partial electrical loads. The Department further stated: "The capability to produce power in levels ranging from several kilowatts to megawatts makes the acquisition of fuel cells appropriate for most military construction programs when fuels are available at a reasonable cost. The construction of new facilities and the retrofit of existing facilities to use fuel cells to meet energy self-sufficiency and energy conservation goals will be particularly desirable."

The Committee recommends that several projects be funded in FY 1981 in order to conduct operational testing of fuel cell powerplants to verify their performance. The Committee directs that minor construction funds under the exigent minor construction budget be used for operational testing of the system in a variety of applications and locations. The projects recommended include:

Project	*Minor construction to be used*
Fort Lewis, Wash., barracks modernization	$500,000
Naval Station, Adak, Alaska, enlisted housing modernization	500,000
Fort Campbell, Ky., company administration/supply building	500,000
Nellis Air Force Base, Nev., enlisted personnel housing	500,000

In addition, the Committee directs the Air Force Aeropropulsion Laboratory to test two additional units in remote locations.

All awards for fuel cell contracts are to be made through competitive bidding.

STATUS OF FUEL CELL PROPOSAL

Senator **Rudman**. Thank you very much.

Reverend Collins, what is the status of that fuel cell proposal? Is it something that is currently in the Army Corps of Engineers budget?

Reverend **Collins**. The Appropriations Committee had given a directive to the Army and to the Air Force and one for the Navy for a small fuel cell. It was done 2 years ago and the amount of money was $500,000 per site to produce a 40-kilowatt unit. A 40-kilowatt unit would run some rooms in this building. We are talking about an installation that gets to be 2,000 times that. Its purpose is to be like a substation for a utility. It is a large venture.

But what we are offering is a method of financing that would be of tremendous advantage in the fifth and sixth, if our projections are correct, and we have had experts look at this, and I am not expert, that at that stage the solution for many sites of electricity and heat can be produced without the Armed Forces putting up any money and we have reviewed this in quite some depth with the Army Corps of Engineers.

Senator **Rudman**. I am familiar with the cogeneration proposals being made all over the country, hydrofuel cells, and all sorts of things. I just had not heard of this particular cogeneration proposal before.

Reverend **Collins**. Well, it is still at the nonmanufactured stage. They have small units. They are building two relatively large units.

Senator **Rudman**. Are you aware of whether or not this project is currently in any of the Army's R&D components that we could clearly identify?

Reverend **Collins**. Well, the only ones we have been able to precisely isolate are the four that were in the committee report on the small units.

Senator **Rudman**. I would suggest, Father Collins, that you might talk to the staff either after this hearing or sometime this week to give us a better handle on precisely where this all is. It is something that I am interested in for a number of reasons.

I think the whole theory of cogeneration with installations—be they universities, hospitals, industries or whatever—that have sufficient demand to warrant their cogeneration and selling of surplus to local utilities, is a concept that has to be explored. I suspect the Energy Committee must be doing something in the area, but why don't you inform us in more detail so at least we can identify it.

Reverend **Collins**. Thank you very much, Senator.

SUBCOMMITTEE RECESS

Senator **Rudman**. The subcommittee will now stand in recess until Thursday, the 10th of June, when we will have a closed hearing on the Rapid Deployment Joint Task Force.

The subcommittee stands in recess.

[Whereupon, at 11:10 a.m., Wednesday, June 9, the subcommittee was recessed, to reconvene Thursday, June 10.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

WEDNESDAY, JUNE 16, 1982

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:10 a.m. in room 1114, Everett McKinley Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Schmitt, Andrews, Garn, Huddleston, and Proxmire.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

STATEMENT OF DR. HANS MARK, DEPUTY ADMINISTRATOR, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DOD SHUTTLE SUPPORT

OPENING STATEMENT OF SENATOR STEVENS

Senator STEVENS. Good morning, sorry to be late.

This is the time scheduled for the subcommittee to inquire into the Space Shuttle partnership of the National Aeronautics and the Department of Defense, and into the equity and fairness of joint funding arrangements.

This hearing was precipitated by several developments that raised charges that NASA is subsidizing military missions on the Shuttle and the Air Force is getting what is termed a "free ride" in this program. These are general implications in a recent report to the Congress by the General Accounting Office, and this position was behind the move of the Senate Commerce Committee to increase the Defense share by about $400 million.

This committee is aware that the administration does not necessarily agree with these developments. The purpose of this hearing is to give the administration an opportunity to present its case and to develop a factual background to assist the committee in reaching its own determinations. We hope and expect that the hearing will permit a full airing of both sides of the cost issue.

Unfortunately, preparation for this hearing was complicated by the absence of an advance statement from the Department of Defense. Although the hearing has been scheduled for several weeks, a copy of Dr. Cooper's statement did not reach us until late yesterday and I have not had a chance to read it yet, Doctor—even though the committee regularly requires the submission of hearing statements at least one week in advance.

This hearing, like many others this year, is a departure from the normal appropriations budget review hearing, and exceptions to the rule on departmental statements are occasionally necessary.

We do not understand, however, why the Department could not prepare its case and deliver its position statement at least a few days in advance of this hearing. I hope in the future that we will be able to have those statements, otherwise we will just simply have to cancel the hearings until the Department is adequately prepared.

We have witnesses today both from the Department of Defense and NASA, and I would like to begin with Dr. Mark of NASA, then Dr. Cooper and then, unfortunately—I am the Acting Leader today—I must return to the floor and I will have to ask one of my colleagues to continue the hearing after that time. We will then proceed to General Randolph.

I hope you will excuse me, Mr. Aldridge, but I do have to go back to the floor—perhaps even sooner.

We do welcome you, gentlemen. I hope you will identify any of those that you call upon to assist you in presenting your statement. Your full written statements will be printed in the record.

Will you proceed please, Dr. Mark?

Dr. **Mark**. Mr. Chairman, it is a great pleasure for me to appear before this subcommittee once again. In the last 4 years with the previous administration, I have had the honor to appear before this group a number of times.

Senator **Stevens**. Can you pull that mike up a little bit, please?

Dr. **Mark**. I am very pleased to be here again and to appear before you. I have a prepared statement, sir, that I would like to submit for the record.

Senator **Stevens**. It will be printed in full in the record.

RELATIONSHIP BETWEEN NASA AND DOD

Dr. **Mark**. I will just summarize the statement in the interest of time because I think the questions from the members assembled here are more important than what we have to say.

I would like to summarize the history that has gone into the relationship that currently exists between the Department of Defense and NASA in the conduct of the Nation's activities in space and aeronautics. It is a long history going back to 1915 when the National Advisory Committee for Aeronautics was established as part of the naval appropriations bill, and in 1917 the first installation of the committee was established at Langley Field in Virginia. The NACA had a strong relationship with the Department of Defense. As a matter of fact, the relevant defense officials, the head of the Army Air Corps and the head of the Navy's Bureau of Aeronautics, were actually statutory members of the committee. This relationship, Mr. Chairman, was continued when NASA was established.

CREATION OF NASA

When President Eisenhower sent the draft of the National Aeronautics and Space Act to the Congress in April 1958, he also sent a message. I would like to quote from that message if I may because it is very, very important to understand this message. It is the foundation of how we do business today.

He said, "I consider it especially felicitous that the National Advisory Committee for Aeronautics will provide the basic organization on which the new agency"—that is NASA—"will build. Not only does the National Advisory Committee for Aeronautics itself already have a firm understanding of the key problem areas involved and a tested method of approach to such problems, but also this organization and the Department of Defense have long enjoyed a highly productive working relationship. This relationship will ease the period of transition that lies ahead and will provide a basis for the close cooperation that will be needed to solve the difficult problems that will be encountered. It is intended that the new agency"—that is NASA—"continue to perform for the Department services in support of military aeronautics and missile programs of the type now performed by the National Advisory Committee for Aeronautics, and also provide similar services with respect to military space programs; the Department in turn will provide support essential for the success of the new agency."

That, Mr. Chairman, is from President Eisenhower's covering letter that was sent to Congress with the 1958 Space Act.

1958 SPACE ACT

When the Congress held hearings on the Space Act, there was testimony both from the Department of Defense and the other organizations involved. I included some of it in my written statement; but, in the interest of time, there is really only one passage that I would like to read because I think it is important.

It is from a statement that the then Deputy Secretary of Defense, Mr. Donald Quarles, made about the relationship between the Department of Defense and NASA. He said:

> In this connection I should like to stress the importance of retaining flexibility of task assignments between military agencies and NASA for two reasons:
>
> First, this relationship will probably evolve as NASA grows in experience and confidence in experimental missilery. Second, the overall national interest will best be served by allowing the military and civilian agencies to work out between them the most effective use of their resources for carrying out those projects, all of course under the policy direction of the President.

DOD/NASA COLLABORATION

In the years that NASA has been in existence—and we are coming up to our 25th anniversary this year—we have collaborated with the Department of Defense and many, many, many projects. Every military airplane that this country creates, Mr. Chairman, goes through NASA wind tunnels. The Department of Defense does not have the facilities necessary to do that. At the same time, NASA uses things that the military develops. All of the space launchers that this country has ever built, with the exception of Saturn, are derivatives of a military vehicle. The Titans, the Thors, and the Atlas were all originally developed by the Air Force for military purposes and were then adapted for civil uses. It was the flexibility that was built into the Space Act that allowed us to collaborate in such a way that both agencies have benefited from this collaboration.

Mr. Chairman, I spent 9 years directing a NASA laboratory, and my colleague, Dr. Cooper, occupied a similiar position. We can both speak from personal experience on how important the flexibility in this relationship is in order for us to get the job done.

When the Shuttle program was approved by President Nixon in 1971, an agreement was made with respect to a division of effort on the program. From the very beginning, Mr. Chairman, the Shuttle was a joint program between NASA and the Department of Defense. At the time, I was the Director of the Ames Research Center so I participated in a small way in reaching these decisions. NASA decided at the beginning to divide the program into rather large chunks so that the division of labor was clear and that we would not spend a lot of time every year worrying about where the boundaries were.

In very simple terms, NASA was given the responsibility to develop and procure the Orbiter vehicles. I know there was some discussion at the time whether that was really the right thing to do, but the final decision that the administration made was that that would be a NASA responsibility. NASA was also given the responsibility to develop the east coast launch site for the Shuttle. In turn, the Department of Defense was given the responsibility for developing the west coast launch site and for developing the upper stage, what was then called the interim upper stage and what is now called the inertial upper stage for the Space Shuttle.

Roughly speaking, Mr. Chairman, in terms of money, the division was between a quarter and a third for the Department of Defense and two thirds and three quarters for NASA. Although there has been inflation and the value of the dollar has changed, the ratio of that division has not. When the Shuttle program is complete you will find that the defense contribution will have been somewhere between a quarter and a third and that our contribution will have been between two-thirds and three-quarters.

Over the years, we have made rather formal agreements because we have had to exchange goods and services in executing the program, and particularly for planning purposes we had to develop a system for charging for the flights. Again, I have that history in my prepared statement. I will not go into that now but develop that topic in questions from the members.

TWO SEPARATE SPACE PROGRAMS

Let me close, Mr. Chairman, by stating that I very strongly believe that the arrangement we have today has benefited the Nation enormously and has contributed to the leadership that we currently have in the area of aeronautics and space.

You had another example of that leadership, Mr. Chairman, just last week in the air battle over Lebanon. The airplanes that we created—and I was personally involved in the creation of the F-16 when I was at Ames—are superior to anything there is in the world. They are superior, Mr. Chairman, because of the collaborative relationship that we have established now over 60 years with the Department of Defense. I feel strongly about this, sitting in my chair now with NASA, but I would like to close by quoting a statement I made 2 years ago when I was Secretary of the Air Force and testified in 1980 before Mr. Fuqua's Committee on Science and Technology in the House.

> There are two separate space programs that are mandated by the 1958 Space Act—one related to all civilian matters and technology development, and the other related to the national security. These two programs have served the Nation well. In May of 1978, President Carter issued a directive that reaffirmed the importance of this congressionally-mandated division of responsibility in a document called PD-37. It is my firm opinion that the Space Act and the division of responsibility incorporated in it have been extremely important to a healthy development of our space activities. We have been able, on the one hand, to conduct a completely open and unclassified civilian space program which has been of benefit to the Nation. At the same time, we have been able to conduct, on a parallel track, classified activities that are even more important.

I made that statement because in spite of the close collaboration that I talked about, it is also necessary to maintain a separation between the civilian and the military space program for the reasons that I have outlined in that testimony.

IMPACT OF LEGISLATION ON SEPARATE PROGRAMS

We, in NASA, are very concerned with the recent congressional actions which, if continued, may have a very disruptive effect upon the separation as well as the collaboration between NASA and the Department of Defense.

The 1983 NASA authorization bill, as reported by the Senate Commerce, Science and Transportation Committee, directs the Department of Defense to reimburse NASA for full costs of placing Department of Defense payloads in orbit using the Space Shuttle.

Now that, gentlemen, is something which we will talk about—and Dr. Cooper will talk about—in response to questions. But, the reimbursement of full costs is something that we had never planned for because for the last 10 years of the Shuttle program, the reimbursement plan was always one that was stretched over a longer period of time and all of our planning, both NASA's and the DOD's—has been based on that.

I am hopeful, Mr. Chairman, that the members of this subcommittee, and the Congress as a whole, will take into account the great turbulence that would be caused in our respective organizations if this new direction actually becomes law. I hope very much that we will be able to have a thorough debate on this subject and that we will, in the end, come to a decision that will best serve the national interest.

Thank you very much, sir.

Senator STEVENS. Thank you.

[The prepared statement of Dr. Hans Mark follows:]

PREPARED STATEMENT OF DR. HANS MARK
DEPUTY ADMINISTRATOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Mr. Chairman and Members of the Defense Subcommittee:

I appreciate being invited to testify today on the Space Shuttle Pricing Policy. During my tenure as Secretary of the Air Force I acquired a lasting respect for your Subcommittee and look forward to each opportunity to testify before you.

There has been considerable recent discussion of NASA "subsidies" to the Department of Defense as a result of NASA Space Shuttle Pricing Policy. However, we believe that there is in fact a well balanced exchange of support between NASA and the Department of Defense in which both agencies receive mutual benefit from complimentary investments, an exchange which continues the historical relationship established by the National Advisory Committee for Aeronautics (NACA) after its first field installation, the Langley Research Center, became operational in the year 1917, and reaffirmed when NACA became the nucleus of the National Aeronautics and Space Administration in 1958.

President Dwight D. Eisenhower on April 2, 1958, in a memorandum for the Secretary of Defense and the Chairman of the National Advisory Committee for Aeronautics informing them that he had on that day transmitted to Congress a Special Message recommending the establishment of the National Aeronautics and Space Administration stated:

> "I consider it especially felicitous that the National Advisory Committee for Aeronautics will provide the basic organization on which the new agency will build. Not only does the National Advisory Committee for Aeronautics itself already have a firm understanding of the key problem areas involved and a tested method of approach to such problems, but also this organization and the Department of Defense have long enjoyed a highly productive working relationship. This relationship will ease the period of transition that lies ahead and will provide a basis for the close cooperation that will be needed to solve the difficult problems that will be encountered. It is intended that the new agency continue to perform for the Department services in support of military aeronautics and missiles programs of the type now performed by the National Advisory Committee for Aeronautics and also provide similar services with respect to military space programs; the Department in turn will provide support essential for the success of the new agency."

On May 7, 1958, in presenting testimony on the National Aeronautics and Space Act of 1958 before the Special Committee on Space and Astronautics chaired by then Senator Lyndon B. Johnson, Donald A. Quarles, Deputy Secretary of Defense, gave testimony which is as relevant today as it was then. He testified:

> "The relationship between the National Advisory Committee for Aeronautics and the military departments over the years have been most constructive and satisfactory. Fundamentally this was because each had confidence in the other, each recognized its proper area of activity and neither tried to encroach on the assigned task of the other. Both worked together in many common projects to which each contributed its special talents and special facilities. The X-15 project is a typical example. We think it is very important to preserve this kind of relationship with the civilian organization responsible for research and exploratory work in the space field. We believe that the National Aeronautics and Space Agency, which this bill would create, would have the latitude to continue this kind of relationship and all our contacts with the officials of NACA lead us to believe that they would propose to do so. We believe the bill as drafted makes it possible to preserve the kinds of relationship with the military and civilian agencies that would best serve the national interest."

He further went on to state, and this is extremely important:

> "In this connection I should like to stress the importance of retaining flexibility of task assignments as between military agencies and NASA for two reasons: First this relationship will probably evolve as NASA grows in experience and confidence in experimental missilery; and second the overall national interest will best be served by allowing the military and civilian agencies to work out between them the most effective use of their resources for carrying out these projects, all of course under the policy direction of the President."

Turning to more recent history NASA's first space launch vehicles were modified ballistic missiles that were developed by the military. The Air Force made many contributions to the Apollo program, including the initiation of the F-1 and RL-10 engines. The lunar module engines first fired in space in Apollo 9 were previously tested by the Air Force's Arnold Engineering Development Center. Much of the technology used to place man on the moon was developed by the close working relationship between DOD and NASA. Similarly, NASA has pioneered significant technology advances which are integral parts of many of our military systems today, including significant contributions of technology and wind tunnel testing time for every U.S. military aircraft flying today.

There is thus a framework of formal and informal channels and joint organizations to ensure a maximum interchange of people, ideas, technology, and hardware. There is also extensive cooperation, on a daily basis, in research, exploratory development, aerospace medicine, test programs, and the use of operational support facilities.

As to the Space Transportation System, in 1970, NASA and the Air Force, acting as the designated agent for DOD, established a committee to jointly review and make recommendations concerning development and evolution of the Space Transportation System that could fulfill the objectives of both NASA and the DOD in a manner that best served the national interest.

In 1971, President Nixon designated NASA as the agency responsible for the development of the Space Shuttle with the cooperation of DOD. With the development of the Space Transportation System as a national vehicle for both civil and military uses, greater demands have been placed on NASA and DOD to resolve differences. It was recognized that compromises and frequent negotiations between agencies would be involved. Despite developmental and funding difficulties over the years, both organizations have always responded very well.

In 1972, NASA and DOD agreed on Kennedy Space Center (KSC) and Vandenberg Air Force Base (VAFB) as launch site. DOD committed to the acquisition and operation of VAFB. NASA and DOD agreed in 1973 that DOD would develop the Interim Upper Stage, later to be redesignated the Inertial Upper Stage (IUS). Incidentally, there was some Congressional opposition to this action at that time because, as Shuttle development was assigned to NASA, DOD's development of an upper stage was viewed by some as DOD subsidization of NASA programs.

In recent years, NASA and DOD have agreed on DOD-funded modifications to NASA facilities to handle classified missions while DOD is acquiring its own capability for mission planning and control of DOD Shuttle flights. NASA and DOD have developed agreements on the Tracking and Data Relay Satellite System (TDRSS), new upper stage requirements, manpower detailees, aircraft and equipment loans/transfers, and other Shuttle related activities of mutual interest.

Formal agreements between our agencies have also been consummated as the STS program has evolved. In April 1975, NASA and DOD signed a Memorandum of Understanding on the Management and Operation of the Space Transportation System. That agreement was revised in 1977 and again in 1980. As a corollary to the 1977 Memorandum of Understanding, in March 1977, NASA and DOD completed a Memorandum of Agreement establishing the reimbursement provisions for DOD missions on the Shuttle. Under that agreement, DOD was to pay a fair share price for launch of its payloads, recognizing that DOD (unlike other users) also would incur STS investment, operating and support costs. On that basis, it was agreed that DOD would be charged a fixed price equivalent to $12.2M in FY '75 dollars for each flight for the first six years of operation. That price was intended to cover materials and services with the exclusion of those services exchanged between NASA and DOD for launches at KSC and Vandenberg. Both agencies have recognized that those costs have risen far beyond those projections. Additional factors have also impacted the reimbursement agreement, including the slips in the schedules of both Shuttle itself and the construction at VAFB. Therefore, we have been working to establish a new price for DOD launches. Budget limitations have made agreement difficult, but negotiations are continuing, and I expect that we will agree on a new price in the near future. I also expect that we will maintain the principle of recovering the "out of pocket" costs to NASA for goods and services in establishing this new price.

There is a substantial DOD investment in the Shuttle, estimated by DOD to be approximately $10.9 billion budgeted through FY 1987 for Shuttle related development and operations. Within this total, DOD Shuttle related development costs alone total about $5.7 billion through FY 1987; this includes the development of the Vandenberg Shuttle launch site, the Inertial Upper Stage, Shuttle transition and operations capability development costs, and the Shuttle portion of the Consolidated Space Operations Center (CSOC). Investment to date, and the subsequent DOD STS operations funding, have been and remain directly proportional to Defense STS usage.

Currently, there are 65 operational Shuttle flights manifested through FY 1987, 20 of which (3i percent) are for the DOD. There is a similar proportional relationship through FY 1994, with DOD projecting 113 flights out of 311 total flights. Current Shuttle configuration while designed to meet DOD mission requirements, is thus primarily a civil program, and R&D, production and basic operations cost should be funded by the NASA appropriation.

Notwithstanding the extensive cooperation, cross utilization and interaction between NASA and DOD the 1958 Space Act does declare that United States aeronautical and space activities shall be the responsiblity of, and shall be directed by NASA except for activities peculiar to or primarily associated with the defense of the United States, which shall be the responsibility of the DOD. As I stated in my testimony before the House Committee on Science and Technology in July of 1980, while serving as Secretary of the Air Force.

> "The two separate space programs that are mandated by the 1958 Space Act--one related to all civilian matters and technology development, and the other related to the national security--have served the nation well. In May of 1978, President Carter issued a directive that reaffirms the importance of this Congressionally-mandated division of responsibility (PD-37). It is my firm opinion that the Space Act and the division of responsibility incorporated in it have been extremely important to a healthy development of our space activities. We have been able to conduct a completely open and unclassified civilian space program which has been of great benefit to the nation. At the same time, we have been able to conduct on a parallel track classified space programs that are vitally important to the national security."

As NASA's Deputy Administrator, I remain convinced that it is important to maintain that separation wherever possible.

We are concerned with some recent Congressional actions which, if continued, may have a disruptive effect upon that separation and upon NASA/DOD relationships and agreements, particularly regarding the Space Shuttle. The 1983 NASA Authorization bill as reported by the Senate Commerce, Science and Transportation Committee and passed by the Senate on June 9, directs the Department of Defense to reimburse NASA for full cost of placing Department of Defense payloads in orbit using the Space Shuttle. The Committee estimates this to be $409 million due NASA in Fiscal Year 1983. This bill, if enacted, would reverse 65 years of a policy which allowed the military and civilian agencies to work out between them the most effective use of their resources in carrying out both aeronautics and space projects. Our organizations, NASA and DOD, have worked well and successfully together for those 65 years and are now working well together on the national STS Program. As problems arise they are being delt with effectively and major progress is being made on elements of the effort.

Substantial changes in the basic budget pattern established for the program could have quite negative effects on our fundamental organizational structure and thus on the STS Program itself. Congress, of course, retains the final power to determine what programs are to be carried out and at what funding levels, but I believe that in the context of the Space Shuttle Pricing Policy the overall national interest will continue to be best served by allowing the Department of Defense and NASA to work out between themselves the most effective use of their resources for carrying out the Space Shuttle project.

In conclusion, Mr. Chairman, I am hopeful that you and the Members of this Subcommittee and the Congress as a whole will continue to support the Space Transportation System without the necessity of legislating a mandatory contribution level for the Department of Defense or for any other Federal agency and thus permit the successful completion and operation of the system to meet both civil and military needs.

Thank you Mr. Chairman and Members of the Subcommittee.

DEPARTMENT OF DEFENSE

Defense Advanced Research Projects Agency

STATEMENT OF DR. ROBERT S. COOPER, DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

ACCOMPANIED BY:

- HON. EDWARD C. ALDRIDGE, JR., UNDER SECRETARY OF THE AIR FORCE
- BRIG. GEN. BERNARD P. RANDOLPH, DIRECTOR, SPACE SYSTEMS AND COMMAND, CONTROL, COMMUNICATIONS, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT, AND ACQUISITION, DEPARTMENT OF THE AIR FORCE

Senator **Stevens**. Dr. Cooper, could you summarize your statement, please?

Dr. **Cooper**. Thank you, Mr. Chairman.

First, I would like to apologize for not having the statement here at the appropriate time as stipulated by the committee. I assure you that it was out of no disrespect at all for this committee or for the issues that are being discussed here, but mainly for two reasons. One, the complexity of the issues that are raised by the legislative proposals that we find before us today; and secondly by the ambivalence that many of us who have been involved in the Space Shuttle program feel for the resolution of some of these issues.

Since you have not had a chance to look over this statement I would like to go into some detail with regard to some of the points that are made here because I think they may benefit the subsequent discussion that we might have.

Senator **Stevens**. Let me interrupt you, because I do have to go back at 10:30, and I am sorry. I will ask Senator Schmitt if he will chair the hearing.

I just want to say this; we have no intention to disturb the relationship between the Department of Defense and NASA. This is not unrelated to other matters that have come before the Appropriations Committee in its oversight.

COMPUTER USE BY SMITHSONIAN INSTITUTION

I remember when the Smithsonian was getting into the business of running computers and most of the agencies that discovered the Smithsonian had that fine computer, were using time on it. We kept getting increased requests for operation of the Smithsonian computer and we decided that there ought to be a fair allocation of that cost among the agencies involved, and that it should not look like the Smithsonian was suddenly running up a gigantic budget.

At first it was misunderstood, but I think the Smithsonian finally understood we were trying to assist.

UP FRONT MONEY PAID BACK BY DOD

We have the same feeling about this. We really do not understand why there should be a situation with the massive increase in funding for the Department of Defense, why in effect the Department of Defense should be running a tab with NASA over a long period of time. That is really what is going on, NASA puts the money up front and DOD pays it back over a period of time.

It could not exist in the private sector, the up front money would not be recovered in time. Under this circumstance with the increase in Defense, as far as I am concerned I am going to ask the committee if they will try to find out. Why is it with the increased emphasis that there is in this program for Defense, why there cannot be current funding of the utilization of the Shuttle program rather than a concept of payback after a period of time?

It is also related—the same thing—to the Department of Defense, frankly, with the Coast Guard. Senator Andrews and I went into that in depth. We find that the Coast Guard builds its vessels to meet the specifications of the Department of Defense, but it has to get the money up front and then, 3 to 4 years later it gets paid back by the Department of Defense.

In a period when civilian agencies are being reduced and defense agencies are being increased, it puts a particular strain on a civilian agency to continue funding of that type.

So, I do think this is a very important hearing and I ask Senator Schmitt to get us the answers to these questions we have prepared.

I thank you for your courtesy, gentlemen. Excuse me.

Senator SCHMITT [presiding]. Proceed, Dr. Cooper.

Dr. COOPER. Thank you, Mr. Chairman.

First I would like to say—and I will try to summarize some of the comments that are made in my statement—I would like to make some of the points so that we can expand on them in our discussion.

First of all I want to point out that the Space Shuttle really is a major business enterprise and it is difficult to compare it with other situations that one finds in the Federal establishment, relations between organizations and the use of equipment and services.

It probably is more comparable to the starting up of a major business enterprise in the commercial sector. I think if we focus on that point of view, we may be better able to understand the issues that are involved here.

When the concept of the Shuttle operations was first considered by NASA, they faced the problems of how to start a major business enterprise and how to introduce an entirely new service that was somehow competitive with the current way of doing business, which was then on expendable launch vehicles.

I can vouch for the fact that there was a good deal of discussion because during that period of time I spent a short time working in the Office of the Secretary of Defense and was responsible for aiding the Secretary in understanding and establishing the national policies with regard to how to start up this major enterprise, and how to divide the tasks in the development program and in the early operations of the Space Shuttle.

12-YEAR AMORTIZATION PERIOD

It was decided at that time that there was no way that NASA could charge the initial operational costs of the Space Shuttle, but that these costs would have to be amortized over a substantial period of time with civil users paying considerably less than the actual operating cost during the initial years, and paying somewhat more than the actual operating costs during the latter years of that amortization period, and that over the amortization period there would be essential break-even. That period of time was taken as 12 years.

Now, that 12-year period of time, admittedly, was arbitrary but it did have some driving factors associated with it.

The 12-year period of time made it possible to set a price per launch which was at least in a sense competitive with the expendable launch vehicle costs which were projected for that same period of time for the launch vehicles that we were using at that time, and which we expected could be competitive with any launch vehicle operation which could be set up anywhere in the world, particularly that which was being contemplated in Europe at the time by the French, and that was expected to be built up—the capability expected to be built up—in Japan.

So, the setting of that price level and the amortization period of time had these forces, these competitive forces, associated with it as well.

There was an equally good argument that said that amortization period would be 20 years, which was more likely the useful lifetime of the Space Shuttle as a system, or some larger fraction of 20 years which prospectively, at least, could have driven up the use of the Shuttle during the early years and made it an even more cost-effective system than it appeared to be when we first started the development activity.

Now, the underlying principles that were set up in this business arrangement between NASA and the Defense Department, and the policy that was established for the other Federal agencies that used the Space Shuttle, and the policies that were established for commerical launches, all took these factors into consideration.

But at the same time they took into consideration the participation that Defense was to have in the Space Shuttle program, and the types of arrangements for reimbursement of reciprocal support that existed among Federal agencies in previous agreements of a similar type.

All of this was done with very careful management consideration in both agencies and in other parts of the Federal Government. It was promulgated in public through representations by NASA in the Federal Register, and it was done with the assent of Congress.

All of the planning, programing, and budgeting activity that has been done subsequently, not only in Defense, but also in NASA, in NOAA, and in commercial organizations that use the Shuttle, as well as in foreign organizations that have an interest in using the Shuttle has been done on the basis of the policies that were established, and with the prospect that those policies would be maintained over a substantial period of time. Certainly over the business planning cycle of the organizations involved.

It is very important that you realize that these things were done in a businesslike environment with business relations and businesslike issues being involved.

Now, in order to structure these policies there were a number of assumptions that were made, and the assumptions had to do with such things as the projection of traffic on the Space Shuttle for that 12-year period of time. A projection of the rate at which flights would be actually achieved, and a projection of the operating functions of the system itself.

Now, if you look at our current understanding of the system, its capabilities and the likely cost in each of these areas, we can see today that those assumptions were not entirely correct.

There have been schedule slips which have caused the initial operating period to move downstream somewhat. There have been cost increases in certain expendable elements of the system, and we have new understanding of the operating costs that will be incurred at the launch facilities and in the support areas.

COST PER LAUNCH TO DOD

Now, based on the original assumptions, a cost per launch in 1975 dollars was set for Defense that was approximately $9 million with the provision that costs would be escalated according to the standard escalators that would be in effect in each of the subsequent years.

In consideration of the estimate and the uncertainty of that estimate, we actually increased the cost-per-launch agreement to $12.2 million, even though the approximate estimate of the actual cost was $9 million in 1975. We increased it to $12.2 million in 1975 dollars which gave a 30- to 35-percent pad for unexpected potential future costs.

Now, we have held to the policies and we have recognized in the recent past that perhaps the changes in the assumptions due to experience required us to revisit the pricing policy in relationship to the Department of Defense.

So, in the recent past we have entered into discussions with NASA over the issue of pricing and whether there was an equitable way to adjust the cost per launch to come into line more with our current experience. There may be a requirement even in the future to revisit those costs per launch pricing policies as our experience in this area increases.

But we feel that this is a business-like arrangement that has been established and that we have the flexibility to accommodate the changes in our experience.

SHUTTLE PRICING POLICIES

Now, along that line we are even going further by establishing a joint committee with NASA which I cochair with Dr. Walter B. Olstad, which is looking at the overall pricing policies between Defense and NASA with regard to all of our reciprocal agreements, including our aeronautical facility use.

Senator SCHMITT. Dr. Cooper, if you can move your mike a little bit closer. It sounds like at least temporarily you are going to have some competition.

Dr. COOPER. All right.

Senator SCHMITT. Probably all those space scientists who feel like you are stealing all their money. [Laughter.]

Dr. COOPER. Our major concern right now, of course, is with the two major legislative proposals which have been made, specifically the one by the Senate Commerce Committee which would reallocate $409 million of NASA's fiscal year 1983 Shuttle funds on the premise that Defense would make up these costs by transferring funds from its budget.

A similar action of the House Budget Committee recommended transferring about $300 million from the Defense budget to the NASA budget in the fiscal 1983 period.

These initiatives would result in substantial increases in cost for Defense use of the Space Shuttle. We believe that these legislative proposals would be tremendously disruptive and would have a serious and deleterious effect on the management relationships that we have previously established with NASA.

On the issue of the large budget, Defense does have a major increase in its budget this year, but that increase is really in recognition of nearly 10 years of neglect. The pressures on that Defense budget are enormous.

You must recognize that the programs in Defense that have survived the programing, planning, and budgeting activities for the fiscal 1983 budget have been worked in a way that places programs in the appropriate priority and really leaves us even a substantial bit short of probably what our needs are.

To make a late change of this magnitude, particularly in an area such as space where the planning horizon can be as many as 7 or 8 years in the future would be a tremendous burden and would work management mischief which is very difficult for us even to assess the consequences of.

DOD SUPPORT OF SHUTTLE

I want to point out that Defense has supported the Shuttle in critical periods during its development lifetime. I think without the substantial support of Defense during the early years of the Shuttle program there would have been many opportunities for the Nation to lose its resolve and to have either quit the Shuttle program or to substantially restructure it. So, it would not have had the tremendous potential that it has today for serving the national interest.

We would like to continue that support for the Space Shuttle program. We feel that the Shuttle is a wise and judicious decision on the part of the Nation to maintain its preeminence in space, and we would like to continue as a major partner in that enterprise with the expectation that we will be able to benefit in a substantial way from the capabilities of the Shuttle.

We are fully aware that we have an obligation in the future to bear the appropriate burden with respect to operational costs in relationship to Defense use. But we think we have the management principles in place and the management relationship with NASA to manage that issue, and over the longer period of time to certainly contribute to the program both in the support and in the operational area.

Senator SCHMITT. Dr. Cooper, I am sorry to interrupt, but did I understand you to imply that if there were significant changes in the pricing policy to DOD that in contravention to Executive orders both you and I have seen, that DOD would withdraw support for the Space Shuttle?

Dr. COOPER. No; I am not implying that at all.

Senator SCHMITT. Well, you said you would like to continue support. It sounds to me like the reverse side of that coin is that you would withdraw it if there is any significant change in pricing policy.

Dr. COOPER. I do not mean to imply at all that Defense would be in a position not to support the position of every past administration has been involved in the Shuttle, as well as this administration, but only to say that it would be more difficult. The arrangement and the connection and the forthcomingness of Defense in that support could potentially be influenced by these measures. I think we must realize this and take that into account.

Senator SCHMITT. It does not sound like that to me, Dr. Cooper, but why not go ahead. But I do not like the sounds of that at all. I have spent too many years and too many other people have spent too many years trying to drag Defense—kicking and screaming—into the space age to hear that kind of an implied threat that you would begin to undermine or withdraw support for the use of the Space Shuttle in national defense activity.

That is a whole new ocean out there, Dr. Cooper, and from conversations with you and others I still find it totally remarkable that the Defense Department does not recognize it in its full implications to national security and keeping the peace.

Dr. COOPER. Well, I believe that we do have that recognition and that we are fully supporting the Shuttle now, and we will continue to do that.

What we are talking about is the potential disruption of the management relationships that allow that to happen with great facility today. I want to caution about that because I think it is a major issue.

Senator SCHMITT. I am sure that whatever the Congress may decide to do, that DOD and NASA can continue to find management relationships that will allow them to work together in the national interest.

Please, continue.

1970 PROJECTIONS ON SHUTTLE USE

Dr. COOPER. Let me now cover briefly what the projections were in the latter part of the seventies about use of the Space Shuttle and the Defense participation in that.

In the mission model of 1979, we projected about 572 Shuttle flights through 1992 of which Defense payloads would have represented about 156 in the 12-year planning period.

This number of flights was approximately 27 percent of the total expected or projected Shuttle use for Defense. Now, our current projections in this budget year are that Defense will use 113 of a total of 311 planned flights in that initial 12-year period of time—now extending through 1994—which does represent an increase from 27 percent to about 36 percent of the total projected flights.

Now, one thing you have to realize is that even though our planned use, that is Defense's planned use, has increased in relationship to the whole, our projected use of the Shuttle has decreased by 28 percent.

Now, this general aberration makes it look as though the Shuttle is actually becoming more and more of a military vehicle. We have heard comments of "militarization" of the Shuttle as a result of that. It appears, though, that it is not so much a militarization because our projected use of the Shuttle has actually diminished over that period of time, as it is a decivilianization of the Shuttle.

I think that there is a message in there. The full capability of the Shuttle and its usefulness to the Nation really depends how much it is used. We must set policies and we must take management actions which facilitate the use of the Shuttle and which make it easier for people to use the substantial capabilities of the Shuttle than perhaps to try and meet their needs in other ways. By doing this, we can make the Shuttle essentially more cost effective for everyone.

In summary of the last point, the Shuttle is really a national capability and in order for us to maintain our leadership in space we really have to step up to the realization that it needs our early support.

We believe that tampering with the management arrangements that have been made in the early years of the Shuttle at this late date, well in front of the planning horizon of all of the organizations and agencies that had planned initial use of the Shuttle, can only damage that transition to Shuttle operations which, I believe, we all think are in the national interest.

As a national program I think it deserves all of our support. But again, I caution that taking extreme policy change actions at this time could actually inhibit the end result that I think we all seek.

In the longer term, the management principles that have been established for pricing arrangements between NASA and DOD, I think, will serve the national interest and there is enough flexibility there for us to make appropriate adjustments so that equitable costs are borne by the Department of Defense over the planning period of time that we have set for ourselves in the principles.

Basically, that summarizes what is in my statement, and we would like to answer any questions that you have. We have the Under Secretary of the Air Force here who can also respond, and General Randolph who is the principal staff officer in the Air Force for Space and C-3.

[The prepared statement of Dr. Robert S. Cooper follows:]

PREPARED STATEMENT OF DR. ROBERT S. COOPER
DIRECTOR

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Mr. Chairman, I am pleased to be here today to discuss the important issue of Defense support for the Space Shuttle. The Shuttle is soon to be declared initially operational and represents an invaluable national resource for the exploitation of space. It is unfortunate that, as we approach the threshold of this new era of greatness for the United States in space, the future is clouded by issues such as those confronting this hearing.

During the past few months there has been considerable public discussion of pricing policies in regards to Shuttle users. Your convening this hearing today acknowledges your concern over and interest in these policies. I believe there is a certain amount of confusion at the present time, and I hope that I will be able to eliminate this confusion and provide you with a sound foundation on which to base your Committee's deliberations.

In my statement I will briefly discuss the history of Shuttle support by the DoD and its rationale and will attempt to put current issues in perspective. I will conclude with some observations concerning the overall NASA-DoD relationship in management of the Shuttle program.

When the concept of Space Shuttle operations was first considered by NASA, they faced a very common problem which is prevalent in private industry--how to introduce a service competitively while at the same time recovering operating costs. Had NASA elected to bill actual costs initially, the users of the shuttle would have been forced to pay many times the amount per flight that later users would have been charged. As a result of an actual cost reimbursement policy, NASA would have been unable to book the early flights because expendable launch vehicles, although more limited in capabilities, would have been cheaper.

To circumvent this problem, NASA structured reimbursement policies with the objective of recovering operating costs over a twelve-year period. It was clearly recognized that NASA, as Shuttle operator, would have to bear the burden of near-term operating inefficiencies while flight rates and processing experience levels were relatively low. After this initial period, reimbursements were projected to exceed costs, thus allowing for a "break even" point in the twelfth year of operations.

An analogous approach is prevalent in industry. Otherwise, no one would be willing to buy the first car off the automobile assembly line or the first of a new series of commercial aircraft.

The underlying principles of the various Shuttle pricing policies were widely known prior to their promulgation by NASA in 1977. Since their inception, these policies have provided a businesslike approach to both management and funding for the Shuttle. Congress has been aware of these policies and has, until this time, approved the program based upon them. The DoD commitment to Shuttle was based on the expectation of acquisition of a set of capabilities within the cost estimates of these policies, and it was according to these policies that the DoD submitted its FY 83 program.

In order to structure these policies, certain assumptions were required. These included: (1) a projection of traffic for the twelve year period, (2) a projection of the rate at which the flight rate was to be achieved, and (3) a projection of operating costs as a function of the number of flights.

None of these projections as envisioned at the time of promulgation of the reimbursement policies is, by current estimates, entirely consistent with our experience.

We are all well aware of the schedule slips and system recurring cost increases. Turn around times are longer than projected and annual flight capacity is significantly lower than originally anticipated.

In 1977, NASA estimated that the cost of materials and services for a Shuttle flight would be approximately $9 million in FY 75 dollars. In consideration of this estimate, DoD and NASA agreed to a reimbursement of $12.2 million (FY 75 dollars) which included a 30%-35% contingency.

Due to the circumstances unforeseen at the time of this agreement, these cost estimates have increased significantly. In consideration of this fact, within the past year the Air Force and NASA have been conducting discussions to recost the DoD reimbursement per flight based upon actual flight experience. However, nothing we have learned provides a reason for changing the basic cost-sharing principles of the original agreement.

In addition to reimbursement for user charges, Defense is also placing a considerable investment of its own in the Shuttle program. We are making major contributions to the National capability which includes development of the inertial Upper Stage and the building of Shuttle facilities at Vandenberg AFB to support civil as well as DoD users. We are also incurring all costs for DoD unique requirements such as building the Consolidated Space Operations Center and modifying NASA facilities to enable conduct of secure DoD missions. The cost of modifying our payloads for Shuttle launch is not insignificant. Through FY 87, Defense has budgeted $10.9B for Shuttle-related developments, operations, and transition costs to accommodate 20 Defense Shuttle launches. I would note that, averaged over this period, our cost per launch on this basis is in excess of $500M.

In addition to the ongoing negotiations over Shuttle user costs which I mentioned earlier, I am cochairing a group under the auspices of the Aeronautics and Astronautics Coordinating Board which will look at the larger financial relationship between the Defense Department and NASA. Our first order of business will be to revisit the finances of the Space Transportation System in its entirety. I am confident that an equitable arrangement will be achieved whereby NASA's interests are protected and Defense will not be charged exorbitant costs over which we have no control for shuttle usage.

This brings my discussion to a point of great concern. During Congressional review of the President's fiscal year 1983 budget request, two initiatives have been tabled to mandate modifications to the reimbursement agreement. Specifically, a Senate Commerce Committee action would reallocate $409M of NASA FY 83 Shuttle funds on the premise that Defense would make up these costs out of its budget. A similar action by the House Budget Committee recommended transferring $300M from the Defense budget to NASA in FY 83. These initiatives would result in considerably increased costs for Defense users of the Shuttle. The apparent motivation is to increase support for NASA science programs--the rationalization is that the DoD budget is large and we ought to pay our "fair share".

Many people look at the Defense budget and believe that since it is so large, it could easily accommodate these increased Shuttle costs. Notwithstanding the fact that Defense gets credit for a very large budget, it must be emphasized that there are very large demands on that budget. Competition for resources is fierce. Contrary to some popular notions, we cannot afford everything we would like to have. One can even question if we can afford everything we need. Programs that we would have preferred to fund have already been eliminated in the prioritization process. Programs that compete successfully in this environment are programs that are judged to be truly critical to our national security needs.

Under the current budget resolution, we are faced with a prospective $7 billion cut in our FY 83 Defense Programs. In addition, if directed to sustain increased Shuttle costs, we would have to bear this burden at the expense of still other elements of our Defense program. Such actions would disrupt stable budget planning. At this time Defense cannot absorb such an unprogrammed reduction without major program alternations. We do not believe these actions to be in our national best interest.

Further, we in Defense are chagrined by the allegation that we are not paying our "fair share". Indeed, we feel somewhat betrayed by initiatives such as the ones which now confront us.

In those uncertain days when the Shuttle was in jeopardy due to cost and schedule overruns, it was substantive support by the Department of Defnese that did much to sustain the program. This was motivated not only by the desire to make available to the DoD the unique capabilities which the Shuttle promises, but the belief that the best interests of the national space program could best be served by an operational Shuttle system which asserts the preeminance of the United States in space exploitation and which magnificantly demonstrates the capability and resolve of this nation to complete a highly visible and technically challanging program.

We continue to hold these convictions and have continued to work toward delivery of our portions of the national system notwithstanding significant cost growths in these DoD financed elements.

In short, we are maintaining our commitments under increasing budget pressures and are working with NASA to reestablish equitable reimbursements for the increased costs for services which they have committed to provide. Under these circumstances, I believe it is incongruous to suggest that we are not paying or are not willing to pay our "fair share".

With respect to the allocation of this $409 million, I note with interest the identification of $150 million for integration of Centaur into Shuttle. This is an initiative which both NASA and the DoD as a matter of public record have opposed. Indeed, we have proposed, collectively, an alternative plan which better satisfies national needs and which, unfortunately, is in jeopardy due to the confusion engendered by the issue confronting us in this hearing. I note further that the cost impact to the DoD of reduced Inertial Upper Stage production was not considered in the Commerce Committee's "fair" accounting.

While I'm on my soapbox, let me go further and seriously question another currently popular misconception--the one of "militarization" of the Shuttle. The allegation that the DoD is taking over the Shuttle simply has no basis in fact. The real "facts" are these:

The Space Shuttle was not designed as a military capability. It is not a war-fighting system, and we have no compelling motivation to assume responsibility for its operation. The Shuttle provides a support service--that of space transportation. The DoD will use that service to deploy our national security payloads.

In 1979, we projected 156 of the 572 planned Shuttle flights through 1992 would be for Defense payloads. This was approximately 27% of the total projected use. Our current projections indicate that Defense will utilize 113 of 311 planned flights through 1994, or about 36%. So while our planned use has decreased by 28%, concurrently Shuttle capability has decreased by 46%. This aberration fosters the image of increased DoD use when in fact our actual planned use has decreased. I do not believe this signals "militarization".

Further, those who understand Shuttle operations recognize that it is intensive use of the resource that will make Shuttle ultimately economical. Without sustained commitment by the DoD as a major user, the Shuttle may never be economically viable.

Viewed from this perspective, our participation is not motivated by "take over" but by sustained commitment and contribution to the acquisition of an enhanced national capability.

Defense maintains its position of planning to exploit the Shuttle as a National asset to the fullest extent.

The Space Shuttle represents a National capability that will maintain our leadership in space in areas related to National security as well as in science and commerce. We are dedicated to recovering the cost of Shuttle operations in such a way as to make the Shuttle competitive with expendable launch vehicles.

The DoD fully recognizes the underlying problem which provides the motivation for the Commerce Committee initiative. We acknowledge the problem which confronts NASA with respect to maintaining a balanced program in space science and aeronautics while implementing its charter to develop Shuttle as a national capability as a first priority among its programs. But we believe that NASA's non-Shuttle related programs must be left to compete freely for resources, based upon their individual justifications just as our Defense programs must be individually justified.

In adjudicating "equitable" solutions, the question of whether or not the Government, through the operating agency's appropriation, should partially bear the near-term burden to Shuttle operations costs to achieve the goals of a National commitment must be considered as well as how to incentivize the efficient operation of the system. Without additional appropriations, shifting the burden from operator to users will be at the expense of user programs.

Perhaps it's time to recognize that achievement of a bold national goal like Space Shuttle requires not only commitment, but also adequate funding and capability. Technical prowess has been demonstrated--the Shuttle has flown successfully. We need now to examine the strength of national commitment in terms of the competition for national resources and not focus merely on a DoD budget which is also stressed in terms of obligations and priorities.

In conclusion Mr. Chairman, I would like to emphasize one last point which I believe may have been lost in the rhetoric of cost issues regarding the Shuttle. Congress, this Administration, and many in the private sector have made issue of duplication, competition and waste within the Federal Government. The Space Shuttle program is probably one of the best examples of interagency cooperation in existence today. NASA, the Defense Department, other governmental agencies and private concerns have cooperated through three changes in Administration to develop Shuttle as a National asset. This spirit of cooperation is now being strained by pressures to increase Defense charges in order to offset funding pressure on NASA programs.

I can assure you that no irrepairable damage has yet been done to NASA-Defense cooperation. In fact, just this past week the senior management of NASA and Defense met to review the status of the Shuttle and other programs of common interest. However, if pressure is maintained which generates an image that NASA must exact increased charges from Defense to fund its programs at our expense, this special relationship could be compromised at the expense of all.

We firmly believe that our interagency agreement with respect to reimbursement for Space Shuttle use is an appropriate subject for interagency deliberations. In the continued spirit of DoD-NASA cooperation, those deliberations are proceeding. We solicit your support for this approach and urge your rejection of "equitable" agreements by Congressional decree.

Thank you, Mr. Chairman.

GENERAL QUESTIONING

1977 SHUTTLE MANIFEST VERSUS CURRENT MANIFEST

Senator SCHMITT. Thank you, Dr. Cooper. I want to make sure that I yield to Senator Proxmire before he has to leave at 11 o'clock.

Before I do that, Dr. Mark, let me explore a little bit the 1977 agreement which everybody keeps going back to, and which, I understand, is in some state of revision at this point. But nevertheless, it seems to have set the so-called management environment between NASA and the DOD.

The Shuttle manifest for 1977 shows a total of 487 Shuttle launches during the 12-year period covered. DOD launches at KSC are listed on that manifest as 67, while non-DOD launches at Vandenberg are listed at 78, with 7 reflights for a total of 85.

Now, do you agree that that is the manifest situation as it was represented in the 1977 agreement?

Dr. MARK. It was.

Senator SCHMITT. The current traffic model, however, shows a total of 234 launches, and I think there is a reason why that does not agree with Dr. Cooper, namely that we are now at the authorized 24 flight per year maximum.

Again, 234 launches during the first 12-year period, down by about half of what it had previously been; 28 operational flights through 1985; 24 a year maximum for fiscal year 1988 and subsequently.

Of the 50 flights at Vandenberg, however, only 7 are listed as non-DOD; of 184 flights at KSC—Kennedy—68 are listed for the DOD.

Do you agree that these figures now represent the situation which we have in the current manifest?

Dr. MARK. They represent our current planning situation. We are maintaining, Senator Schmitt, the possibility that we may go to a 40-flight per year rate, and that is why you will see that number 312 and 234 used in a somewhat loose way.

Senator SCHMITT. I understand that.

Dr. MARK. Twenty-four is the minimum.

Senator SCHMITT. I actually believe you are going to make it. But the critical thing is that there has been a major change in the NASA activity at Vandenberg. Now, could you explain to me why this change has occurred?

Dr. MARK. There are several reasons. One has to do with the fact that the Spacelab program has been cut back and we were planning full orbiting Spacelabs. Another is that we are not planning to fly as many Landsats which are also polar orbiting spacecraft as we did. Part of the reason for that, sir, is that these things have lasted longer than we originally thought. Therefore, one reason why the launch rate has gone down is that the spacecraft we built worked better than we thought they would.

Senator SCHMITT. The ones you mentioned, and there are others that could be mentioned, represent that the canceled flights were programs of science and application which were either deferred, canceled, or not proposed due to lack of funding available for NASA budget; is that not correct?

Dr. MARK. They were delayed, when viewed with respect to other things, yes, sir.

VALUE OF LAUNCH SERVICES TO DOD

Senator SCHMITT. Using data on Shuttle unit costs supplied to the committee by NASA one can estimate—and I underline "estimate"—the approximate value to the DOD of the launch services performed by NASA for them at KSC, and therefore test whether the quid pro quo basis for DOD's not paying for launch and flight services, the so-called bookkeeping arrangement, is in fact still valid. On the surface it would seem not to be valid because of this major change in the flight manifest relative to NASA launches at Vandenberg.

The estimates of my staff and of the Commerce Committee is that whereas in 1977 NASA came out $12 million to the good over that 12-years period with the manifest of that time, NASA now has about $2 billion shortfall in 1975 dollars, which represents approximately $3.7 billion in 1983 dollars.

Do you agree that if we maintain the bookkeeping arrangement that this represents the approximate state of things at the present?

Dr. MARK. No, sir, I could not accept that number because I do not know how you got it.

Senator SCHMITT. We got it from your numbers, and the testimony we have received so far has not refuted it.

Dr. MARK. I do not understand how you got it, sir.

Senator SCHMITT. Well, we have been working with your staff, Dr. Mark, and others to try to clarify those numbers, and so far we received no rebuttal of it.

Dr. MARK. We give Congress all our numbers. I do not know what you have done to make these calculations and I cannot comment on it, sir. I am sorry.

Senator SCHMITT. Well, I guess we are just going to have to continue to try to get you to comment on them.

Dr. MARK. I would be happy to sit down with you and go over the figures. But, you have spent 3 minutes explaining a very complicated calculation to me, and I just cannot comment on it.

Senator SCHMITT. We have been working with you and the Department of Defense now for over a month on this since the Commerce Committee began to move in this area, and so far we have had not refutation of those numbers.

Dr. MARK. Sir, I have never heard that calculation made before. This is the first time I have heard it.

Senator SCHMITT. Yout staff does not keep you informed.

Dr. MARK. I have heard the calculation and have gone over the calculations that are in the bill which your committee proposed. I would be happy to comment on those.

Senator SCHMITT. For example, it is estimated by NASA in charts that NASA has given us, that the Shuttle launch cost in 1984 is between $90 and $115 million. Do you agree with those numbers?

Dr. MARK. Yes, sir.

Senator SCHMITT. And then we drop between $65 and $85 million in 1985.

Dr. MARK. That is correct.

COST PER LAUNCH IMPACTED BY OPERATIONAL COST

Senator SCHMITT. This again, is compared to the agreed-on price of the DOD of $12.2 million, which you are trying currently to update with some other figure.

Dr. MARK. Senator, may I explain what you have just said because I think that is really the principal issue of this hearing.

The costs that we report for operating the Shuttle in fiscal years 1983, 1984, and 1985 are much larger than the costs we project for fiscal years 1987, 1990, and 1994. We expect, Mr. Chairman, to learn about this vehicle and to operate it more efficiently as time goes on.

The fiscal year 1983 cost per launch, if I remember correctly, is somewhere on the order of $130 or $140 million. It varies depending on which mission model you assume.

The cost per launch 6 or 8 years from now will be on the order of $50 million; however, we hope to get it down below that.

In arranging for the price that we charge, which is different from the cost, we have adopted the common practice that is used in private business, which is called "flat pricing." That is, you estimate the time over which a project stays alive. We have talked about a time horizon of somewhere between 12 and 20 years, depending on how the Shuttle works.

Then we say, let us charge the average cost of a flight or whatever service we are performing to each customer. What that means is what Dr. Cooper said, that the customers in the very beginning pay much less than the actual cost of producing the service, and the customers at the very end pay more. This is the same thing that an automobile company does when it makes a new car model. If you had to pay the actual cost, sir, of the first car that comes off the production line, you could never buy an automobile.

PHILOSOPHY FOR CHARGES

Senator SCHMITT. Dr. Mark, I think you have made your point, but our point is twofold. No. 1 is, is it a matter of good public policy when you look at what else is happening to the total NASA budget to follow that, assuming your estimate is correct?

Second, you are implying that the 12-year average is still going to be around $12 million when in fact the numbers that you have quoted imply $120 million.

Dr. MARK. No, sir. Mr. Chairman, we have just recently, on Friday I think, announced new prices. We are no longer talking about $12 million. We have announced new prices for the commercial world and we are in negotiation right now for a new adjustment with the Department of Defense.

The important point, sir, is that both are still based on the flat pricing philosophy.

Senator SCHMITT. I know that, and we have some real questions from your own numbers of whether you are even close to that flat pricing policy, in addition to whether or not the forward pricing philosophy of under cost in the early years is not doing violence to the Space Act and the other responsibilities of NASA.

Dr. **Mark**. Mr. Chairman, may I address that second point, or shall we defer to Senator Proxmire? I would like to come back to that second point.

Senator **Schmitt**. We will give you plenty of opportunity and I should also say for the record—and then I will yield to Senator Proxmire—that the actual 1977 agreement states that actual costs will be paid after the first 6 years, not an average over 12 years. I refer you to the agreement.

Senator Proxmire?

DOD'S FLIGHTS ON SHUTTLE

Senator **Proxmire**. Thank you very much, Mr. Chairman.

Mr. Chairman, I want to follow up on exactly the line you have asked. I would like to ask Dr. Cooper, in your prepared testimony you say—and this follows up the statistics used by the chairman—"Our current projections indicate that Defense will utilize 113 of the 311 planned flights through 1994, or about 36 percent."

On the other hand, the General Accounting Office report dated April 26 and prepared at my request says the following: "Based on NASA's latest traffic model, DOD is estimated to require 114 of the estimated 234 Shuttle flights through 1994, or about 49 percent of the flights."

Why do your figures differ from the General Accounting Office's?

Dr. **Cooper**. Well, I think it is basically on the planning assumptions there. Our figures are based on an estimated 311 flights during that period of time, which assumes that the flight rate of 40 flights per year of the Shuttle will be achieved.

Senator **Proxmire**. Does that assume the same number of Orbiters?

Dr. **Cooper**. Yes, it does. It is the flight rate with the current four-orbiter fleet that is being brought on line.

Senator **Proxmire**. So, you are assuming the turnaround time will be improved, the production of the external tanks will be abbreviated, and so forth.

Dr. **Cooper**. We are assuming that all of the management projections of what can be achieved today, will be achieved in the future.

Senator **Proxmire**. That is quite an optimistic assumption. Perhaps the reality may lie somewhere in between.

Dr. **Cooper**. Well, I think experience will show that probably the reality of the number of flights will also be somewhat less than our current projections. If you look at the constitution of the Defense mission model you will find that some of the missions that are projected in the outyears are "suspect"—I guess in the way to put it—right now.

I believe that basing detailed decisions today on estimates of the flight rate and the mission model in the outyears is not in our interest. I think we do need to focus on the near term.

Now, from that standpoint I would like to point out that in the near term Defense is contributing the proportion of the program cost that is closely related with its use. For instance, in the 1983 budget the total cost for the Space Shuttle will be about $4.4 billion, about $3.4 in the NASA program and about $1 billion in the Defense program.

Since there will be a total of five Shuttle flights projected, of which one will be Defense, one might expect that Defense should bear a proportion of about 20 percent of that total cost.

But since Defense's contribution is $1 billion out of $4.4 billion, we are actually contributing about 23 percent of the total cost of the program during the 1983 budget year. That is roughly consistent with the one flight of five which will be for Defense in the 1983 budget year.

Similarly, if you compare the expectation in the budget years 1984, 1985, and 1986, you will find that Defense in 1984 will be contributing about 25 percent of the overall program cost of the Space Shuttle program in that budget year and we will be using one of the 10 flights projected in 1984, or only 10 percent of the cost of the appropriate flights.

So, compared to 10 percent of the flights, we will be contributing 25 percent of the cost of the program in the 1984 budget year.

In 1985, those appropriate figures are 31 percent of the flights and 31 percent of the cost.

In the 1986 budget year it will be 35 percent of the flights and 36 percent of the cost.

And in the 1987 budget year, although we will have 40 percent of the flights, we will only contribute about 32 percent.

But you will see that over the 5-year period of time that the total contributions from Defense for the program roughly correspond to the proportion of the flights that we will be using during that period of time.

Senator **Proxmire**. Well, there are some difficulties involved here. In the first place, let me just get some facts so I can get them straight.

The GAO report on Shuttle user charges, dated February 23, concludes that the current charges are currently fixed at such a low level that NASA will end up subsidizing DOD Shuttle use through 1985 to the tune of $588.9 million, about $600 million.

Do you agree with that statement?

Dr. **Cooper**. We do not agree with the basic assumptions that that statement is based on. We understand those assumptions because we have gone over the GAO report very carefully. It is in the assumptions where we disagree.

Our experience in the past has shown that the assumptions that the GAO used to get those figures are not valid.

Senator, let me give you an example of that. During the time I was at the Goddard Space Flight Center, Goddard was the principal manager of the Delta launch vehicle program. Delta is one of the principal expendable launchers that this Nation has used to put spacecraft payloads into orbit.

During that period of time, the Delta went from essentially an experimental launch vehicle to becoming an operational launch vehicle. That is, it went from launching a few payloads a year in a mode where the launch vehicle was being modified regularly to a condition where we decided from a management point of view we would stop the developmental modifications on the program and we would reduce the cost of operations to the absolute minimum required for safety purposes and for purposes of keeping the quality of that operation high.

During that period of time, we drove the number of launches per year up to the maximum that could be handled on the pad that existed at KSC, which is 12 per year. That is one launch a month. During that entire period of time we essentially brought down the cost of that program to a fraction of the cost at the beginning of the period.

We did that by using management judgment and taking risks where we could, and reducing costs where we could.

I believe that the same kind of cost reduction activity on the Space Shuttle program will show that over the period of its lifetime we will reduce the cost of Shuttle operations, we will be able to afford Shuttle launches, and the payback of the operational costs will be assured.

If that does not happen, the Shuttle will not be a successful program.

Senator **Proxmire**. But Doctor, nothing that you have said has refuted the GAO estimates. I hope that for the record—I am not going to ask you to answer it now because I only have a minute or so left before I have to leave—but if you will specify the assumptions with which you disagree and why you disagree with those assumptions.

[The information follows:]

GAO Analysis Inaccuracies

With respect to the GAO's conclusion in their February 1982 report on Shuttle user charges that NASA will subsidize DOD Shuttle use through 1985 to the tune of $588.9 million we note the following inaccuracies in the GAO's analysis:

(1) The number of DOD reimbursable flights through 1985 is 7 not 13.

(2) The total capability of the system through 1985 is 28 flights not 44.

In all fairness, these are facts that have changed since the GAO's analysis, but none-the-less impact the results. More basically we take issue with the following assumptions:

(1) The GAO prorated an essentially fixed operations costs base to arrive at the cost per flight. Under additive cost principles, fixed cost bases for launch operations are the responsibility of the operator and are not recovered between NASA and DOD.

(2) The GAO does not recognize the "preferred customer" status of the DOD due to its major contribution to system capitalization. The suggestion that DOD should be charged the same use fee as other users after our over $10 billion investment in the system (that coincidently also supports NASA as well as other system users) is particularly troublesome. If our investment were prorated over our planned use of Shuttle, we would be sure to be paying significantly more per flight than a commercial customer.

We believe that we should pay our "fair share" under the basic principles of the original NASA/DOD agreement, and the current thrust of our activities is to identify "fact-of-life" cost increases in reimbursable elements. Given these equitable adjustments, we believe the alleged NASA "subsidy" will vanish.

SURCHARGE PAYMENTS

Now I would like to ask you one other question, and I have more for the record that I will submit if the chairman will permit me to do so.

Senator **Schmitt**. Without objection.

Senator **Proxmire**. NASA's past position has been that they would recoup any losses suffered because of charges that were set too low in the early years of Shuttle use by setting a rate in excess of actual costs in the outyears, and you and Dr. Mark have said pretty much the same thing now.

SUGGESTED SURCHARGE

Dr. COOPER. Yes.

Senator PROXMIRE. Are you prepared to pay a surcharge in 1986 and future years to make good on losses NASA may have incurred by charging you too little in the early years of Shuttle use? Plus what would happen in any business, which is that you would pay the interest compounded during that time on the up-front money that has been provided for you.

Dr. COOPER. No, sir, we would not.

Senator PROXMIRE. Why not?

Dr. COOPER. For two reasons. First of all, the planning horizon for Defense is 5 years. We would resist and do not recommend any change in the established pricing policies during the current planning horizon—that is the 5-year Defense plan.

In the outyears I do not believe that we should pay any surcharge that relates to the previous costs because they depend on the future experience. The planning period over which those prices were established and over which we would make adjustments today to the average price over the period of time was 12 years.

We would be willing to pay a surcharge at the end of that 12-year period of time if our experience over the 12-year period of time was that we had not fully recovered costs based on the adjusted pricing policies that we reached by management agreements.

Now, I think that what you ought to focus your attention on, sir, is the principles upon which these pricing policies were established.

They were established on the basis of a cost estimate over a 12-year period of time, and we would like to have management flexibility to make appropriate adjustments so that we can assure the Congress and assure our management that we are able to average those prices out over that period of time.

We believe that major repricing actions at this stage of the game are not called for. That we should continue on the principles that were established in the seventies, and that we have sufficient management flexibility to assure the Congress that through that period of time the average price, multiplied by the number of launches during that period of time, will actually equal the overall operational costs experienced during that 12-year period of time.

Senator PROXMIRE. Mr. Chairman, thank you very much. I apologize for going out of order.

Thank you, sir.

Senator SCHMITT. Thank you. Now I would like to yield to Senator Andrews.

Senator ANDREWS. Thank you, Mr. Chairman.

The thing that bothers me in this whole situation is control, really. If I have a daughter—and I have a couple of them—and they are set up on an allowance and my wife doles out the allowance on a weekly basis. Then they come around and hit me up for a little bit on the side—every father has had that happen—then the control over that spending goes right out the window.

Now, in effect we are dealing with a situation where you come up with a program. You have an allowance that you get from the subcommittee that funds you as NASA. Then you have another parent over here that you want a little additional funding from.

Now, that can either let you get some money without really being under the same structure as you would normally be in one committee that oversees the whole program, or it could also allow this situation to fall through the cracks where you get less than you would if the one group was not assuming you were going to get from the other.

Now, you are talking about a billion dollars' worth of money in fiscal 1983, you mentioned that to Senator Proxmire. Of that billion, is that all allocated on a per-shot basis, or does that represent the overall DOD contribution to NASA for a host of other things?

Dr. **Cooper**. No, sir. The expenditure that I alluded to there was Defense's entire expenditure, our contribution to the Space Shuttle program.

Senator **Andrews**. Just the Space Shuttle program, or all contributions?

Dr. **Cooper**. Just the Space Shuttle program. It consists of developments that relate to the Shuttle which Defense is accomplishing in the Vandenberg complex. It represents a portion of the Consolidated Space Operations Center which is being built by Defense and which is funded with Defense appropriations. It represents our contribution for the one launch that we will have in the 1983 time period.

And there are also expenses related to the inertial upper stage.

RESCHEDULING OF PLANNED FLIGHTS

Senator **Andrews**. But given the reductions that are sure to be made in the defense budget this year, is it likely that if Defense needs are reprioritized that one or both of these planned flights would be rescheduled?

Dr. **Cooper**. I do not believe we have a plan for that.

Senator **Andrews**. How much did DOD spend in fiscal 1982 for the support of NASA on an all-cost basis?

Dr. **Cooper**. Well, in the 1982 budget year we had a major expenditure in each one of these budget categories that I went through previously.

Senator **Andrews**. You categorized it for 1983 at $1 billion.

Dr. **Cooper**. That is right.

Senator **Andrews**. That is a wonderful round, flat number.

Dr. **Cooper**. I would imagine that it would round out to about the same, about $1 billion or less.

Senator **Andrews**. Well, actually this is not an increase over what DOD paid to NASA last year.

Dr. **Cooper**. Recall that these were not moneys paid to NASA, but they were moneys expended in supporting our part of the Shuttle program. Remember, this a joint effort between NASA and Defense.

Senator **Andrews**. Well, now, what are you asking for, a billion in 1983 to be transferred to NASA, or for programs in support of NASA? I want to compare apples with apples if I might.

A moment ago it sounded like you were saying that we are not going to have a significant increase in 1983 over 1982. Then you began to sort of indicate that the categorization of the money in 1982 was a little different than in 1983.

Dr. **Cooper**. No, sir, that is not what I meant to imply. The fact is that Defense has substantial efforts under way that are part of the Shuttle program. We are doing developments and we are making preparations for control systems that relate to the Shuttle. There are expenditures related to these that average about $1 billion a year.

Senator **Andrews**. Let me get around the other way.

Dr. **Cooper**. That is Defense's contribution to the Space Shuttle program to the tasks that we have agreed with NASA that Defense will perform in that program.

Senator **Andrews**. Then the $1 billion that you are going to be asking for in fiscal 1983, or that you are asking for in fiscal 1983, is the $1 billion that you are going to spend as DOD.

Dr. **Cooper**. Out of the Defense budget.

Senator **Andrews**. Not transferred to NASA to be spent.

Dr. **Cooper**. That is largely correct.

GAO BUDGET CALCULATIONS

Dr. **Mark**. Senator Andrews, I wonder if I could interject a point of clarification here.

One of the problems with the GAO report that Senator Proxmire referred to is that in their calculation they do not include the part of the Shuttle program that Dr. Cooper was just talking about. As I mentioned in my testimony, from the very beginning the Department of Defense agreed to budget in its budget for the Vandenberg site and for the upper stage development.

Senator **Andrews**. Right, but part of that $1 billion then represents the cost you are spending, or the dollars you are spending, for the Vandenberg base.

Dr. **Mark**. Yes, sir.

Dr. **Cooper**. That is correct.

COST OF VANDENBERG BASE

Senator **Andrews**. How much of the billion dollars is for the Vandenberg base?

Dr. **Cooper**. Well, during the 1983 through 1987 budget year it will be $1.6 billion.

Senator **Andrews**. Are you going to recover all of the construction cost of the Vandenberg base in this kind of allocation, or just the operating costs?

Dr. **Cooper**. No, none of that cost is to be recovered. As a matter of fact, the initial agreements with NASA were that the development costs of the Shuttle would not be recovered in the pricing of the Shuttle on a per-launch basis.

Senator **Andrews**. So, you are telling us you are spending a billion in fiscal 1983. You just said a minute ago, if I heard right, that part of that is the construction cost of Vandenberg base.

Dr. **Cooper**. That is correct, and there is no intention in the pricing of the Shuttle to recover that cost.

Senator **Schmitt**. If the gentleman will yield.

In the bookkeeping arrangement it is part of the activity, right?

Dr. **Cooper**. No.

Senator **Schmitt**. You are trying to make it a quid pro quo.

Dr. **Mark**. No.

Dr. **Cooper**. No.

Senator **Andrews**. Well, then how can you say, as you did a moment ago, that the cost of constructing the Vandenberg base is part of the billion dollars you are allocating to your contribution to NASA?

Dr. **Cooper**. I did not say it was our contribution to NASA. I said it was Defense's expenditures related to the development of the Shuttle.

Senator **Andrews**. But it is part of the billion dollars you are talking about.

Dr. **Mark**. Senator Andrews, may I interject?

Senator **Andrews**. Sure, go right ahead.

Dr. **Mark**. We are talking about two things here that I would like to try to clarify.

The GAO report that Senator Proxmire referred to did something which contrary to the NASA/DOD agreement. They can do that of course, they are free to do that. But, then you start making calculations that are confusing.

What they did was to say, "We will allocate costs for the development and the procurement as well as for the operation," and that is how they come to their conclusion that we are down a billion dollars, or $900 million is their number.

From the very beginning, the development and procurement costs were regarded as sunk investments; therefore, they were not included in the pricing schedules because the pricing schedules are calculated to recover only the operating costs. This is, of course, the way the Federal Government does business because we do not capitalize on our facilities. Maybe we should and maybe we should change how we do business, and I have argued that in other forum.

ASSUMPTIONS EFFECTING COST RATIO

Senator **Andrews**. The point is that you were asked if you are going to charge on a per-shot basis. And in a sense you partially are, but you are really not because your billion dollars, you just said—Dr. Cooper said—from the Defense Department includes a lot of other things that DOD is spending in support of the space program.

Dr. **Mark**. What Dr. Cooper said in his answer to the question was to make the same assumptions that the GAO people did, and to say, "If indeed you want to include the development and the procurement costs in the ratio, then you have to include Vandenberg"—which the GAO did not do—and then you come up with the ratios that Dr. Cooper did.

Now, I am not proposing that we accept the assumptions of the GAO report because I think they are not consistent with the way the Federal Government normally does business.

Senator **Andrews**. But you went past that point because you said you were including the Vandenberg construction costs in the billion dollars that you allocated to the space program in fiscal 1982 and in the billion dollars—or close to a billion dollars—you are asking for in fiscal 1983.

Now, maybe I need a hearing aid.

Dr. **Mark**. They should be included in the sunk investment. They are not part of the costs that we are planning to recover, sir.

Senator **Andrews**. But they are included in the billion dollars that DOD is talking about as its allocation to NASA.

Dr. **Mark**. It is not an allocation to NASA.

Dr. **Cooper**. It is not an allocation to NASA, sir.

Senator **Andrews**. No, but what they spend in support of NASA in their spending category. You are not transferring any money, you said a moment ago, to NASA.

Dr. **Cooper**. Except for the single launch which we will have in fiscal year 1983.

Senator **Andrews**. Now, is that in addition to the billion dollars?

Dr. **Cooper**. That is included in the billion.

Senator **Andrews**. That is included in the billion, all right. And how much is that single launch?

Dr. **Cooper**. The cost of that launch is, at the agreement with NASA, $12.2 million in 1975 dollars.

Senator **Andrews**. So, $988 million is going to be spent by DOD in fiscal 1983 for NASA-related items, and $12 million is going to be transferred to NASA for the first shot out of the fiscal 1983 budget.

Dr. **Cooper**. $12 million escalated to 1983 dollars.

Senator **Andrews**. Well, yes, escalated to 1983, but $12 million in fiscal 1975 dollars which is probably what, $36 or $37, something like that million.

So, what you are going to spend is some $960 million in NASA-related functions, and transfer $33 million to NASA in direct dollar transfer.

Dr. **Cooper**. Senator, it is better, probably, to look at the $960 million as expenditures by Defense in support of agreements with NASA for things that we would do in the Space Shuttle program.

So, we are a subcontractor, in a sense, to NASA to build a Vandenberg launch complex, to build a second operations center, Consolidated Space Operations Center; to build an inertial upper stage that could be used by all users to get to synchronous orbit; and some other activities related to the transition of DOD payloads onto the Shuttle.

OPERATION SLIPPAGE AT VANDENBERG

Senator **Andrews**. The Vandenberg facility was originally scheduled for operation in August of 1984 and later revised to October of 1985. What effect is this slippage going to have on the level of funds being requested?

Dr. **Cooper**. Our current understanding of what the requirement is to meet that operational date of 1985, which is now consistent with the delay in the initial operating date for the Space Shuttle, is included in the $1 billion request in the 1983 budget to support the Shuttle program and those activities we agreed to.

Senator ANDREWS. What is DOD's view on the need to retain the expendable launch vehicles after the completion of the Shuttle tests?

Dr. COOPER. Well, we have a plan to have some backup expendable launch vehicle capability to back up key national security missions during the period of time when the Shuttle operations are settling down. Those are plans which have long been in place in Defense, have been planned, and programed, and budgeted for in prior years—extending back into the late 1970's—and which we believe are prudent plans.

Senator ANDREWS. Before I yield to my colleague, Senator Huddleston—and this is in the same area—how much in annual operating costs will be saved if we were to eliminate the expendable launch vehicles from our inventory?

Dr. COOPER. I do not have an answer to that, but I would hazard a guess that if we were to choose to do that at this time, that there would be no savings prior to perhaps two budget years beyond where we are today.

Senator ANDREWS. Could you better define that for the record?

Dr. COOPER. We certainly would like to respond to that.

[The information follows:]

TITAN PRODUCTION PHASEOUT

Our current plan is to begin phase out of TITAN production capability at approximately the time of STS-6 currently scheduled for January 1983. This is the first Shuttle/IUS flight. With respect to launch operations, our long-standing plan has been to backup critical DOD missions for 2 years beyond Shuttle IOC at KSC and for one year beyond Shuttle IOC at VAFB. However, we currently program primary TITAN launches from both KCS and VAFB through fiscal year 1985. Based on these plans, the maximum savings associated with elimination of backup capability after completion of Shuttle tests would be approximately $70 million for TITAN launch operations at VAFB for fiscal year 1986. We would not recommend deviation from our plans at this time.

DOD LAUNCHES FINANCED

Senator ANDREWS. Thank you, Mr. Chairman.

Senator SCHMITT. For the purpose of the record, unless I am mistaken it is the subcommittee's understanding that there are two DOD launches to be financed in 1983, and that the CSOC has not previously been part of any agreement between DOD and NASA.

If you want to rebute that, you can do it either for the record or subsequent to Senator Huddleston's questions.

[The information follows:]

FINANCING FOR DOD LAUNCHES

There are two DOD launches currently scheduled in fiscal year 1984. Per our reimbursement agreement with NASA, these will be financed in fiscal year 1983 and are part of the 1983 request.

With respect to your understanding that CSOC has not previously been part of any agreement between DOD and NASA, it should be noted that CSOC was not a validated requirement at the time of the NASA/DOD STS reimbursement agreement which was signed in March 1977. (The CSOC requirement was validated in September 1979). However, the revised NASA/DOD Memorandum of Understanding on Management and Operation of the Space Transportation System dated March 1980 clearly references the CSOC although that specific nomenclature was not used. See for example, sections 2.1, 2.3, 3.1.11, and 3.2.9.

DISRUPTION OF BUDGETARY CHANGES

Senator HUDDLESTON. Thank you, Mr. Chairman.

I think it is important to understand what the proposed legislation actually means to the operation, both from the standpoint of NASA and the Department of Defense.

Dr. Mark and Dr. Cooper, you both indicated the importance of the joint operation and the management procedures that have been in effect.

The question that occurs to me is, to what extent are we talking about, in the proposals that have been made to just budgetary changes, bookkeeping changes, appropriations changes, and to what extent are we talking about an actual disruption in the process that is going on now as far as the way you manage your business, both NASA and the Department of Defense.

Can you give me some comment on that?

Dr. COOPER. Perhaps I could respond to that by trying to prognosticate what would be the result of carrying out the will of the Congress, if the Congress were to proceed down this line of directing large transfers of Defense appropriations to NASA.

First of all, it is quite likely that that cut, or that fiscal year 1983 impact, would fall in the space area. There would be some major part of Defense space efforts which have been carefully pared down in this very stringent budget environment that we find ourselves in to include only those things which are of major national security interest. So, we would be in a position of having to stretch or defer, or perhaps even cancel programs in the Defense space area.

Senator HUDDLESTON. Are you talking about actual launches?

Dr. COOPER. Perhaps even whole programs would have to be eliminated in order to handle the large-scale reductions represented by that proposed $400 million reduction.

Senator HUDDLESTON. But assuming the same amount of money was available, as it is proposed, of course, you would apparently have to take those funds from some other program. You would have to reorder your priorities and make a determination as to whether or not this is as important or more important than some other program. That is not such a bad process to have to go through, incidentally.

Dr. COOPER. That is a process that we have gone through, sir, to arrive at the President's budget. And we face a $7 billion reduction in that, as per the agreement between the President and the Congress on the potential reductions for Defense.

That is going to be a painful process.

Senator HUDDLESTON. But if you were to assume the same amount of money were available, that the appropriations were just adjusted—more taken from NASA, a little more given to Defense, so that you would actually have it, it was just a matter of paying a higher price for your launches—would this then cause any major problem with the management procedures that are in effect?

Dr. COOPER. As a matter of fact, we are negotiating today with NASA for an increased price per launch for Defense, which is equitable over the planning period, the 12-year period, that we previously discussed.

I would suspect that we will come out with an increased launch cost for defense that will be substantially greater than our current agreement which is at $12.2 million in 1975 dollars.

IMPACT OF PROPOSED LEGISLATION ON PRICE

Dr. **MARK**. Senator Huddleston, may I contribute an answer to the question that Dr. Cooper just answered?

Senator **HUDDLESTON**. Sure.

Dr. **MARK**. I think the most difficult thing to deal with, if we were to agree to the philosophy that is proposed by the legislation before you, is instability in price from year to year.

If you were a program manager that has to launch a payload in 1987, you would have to cost your launch services 5 years ahead of time. What you do not want to have happen is for those launch services to change every year depending on our actual costs.

You see, what your legislation requests us to do is to charge DOD our actual costs.

Now, let me read what they are over the next 5 years.

Senator **HUDDLESTON**. If DOD can make its case and make its case to the Congress——

Dr. **MARK**. No, I am not talking about DOD, I am talking about the program manager who is faced with budgeting his resources. You asked me where the instability was.

Senator **HUDDLESTON**. Right.

Dr. **MARK**. The instability is not between Dr. Cooper and myself because we can work with you and work it out. The people that we make things very difficult for are the project managers that have to guess between $155 million in fiscal year 1983 and $56 million in fiscal year 1987 what the launch cost is going to be; that is $100 million.

What we are saying is, we would much rather average that cost over a period to give him a stable cost. Say, "Look, this is what it is going to cost you," and then every 5 years, we readjust the price.

Senator **HUDDLESTON**. I think that is the important thing for us to know, if you are really going to interrupt a good, efficient management process or whether we are just talking about shifting money and bookkeeping, who gets the appropriation, and where does it finally wind up. We can deal with those problems.

But if you are really seriously affecting the efficiency of the program, then that is another matter. Do you believe that would be the case?

Dr. **MARK**. The people we are affecting are the individual program managers of our respective programs who have to budget their launch costs 5 years ahead of time. We do not know what that cost is going to be until we march down this learning curve.

Senator **HUDDLESTON**. Well, presumably DOD could handle that problem if they can make the case sufficiently to the Congress that they need these launches and they need the money to pay for them.

Dr. **COOPER**. Precisely. As a matter of fact, beyond the planning horizon, that is for programs in the 1987 to 1992 fiscal year period, we could handle that in some sense. Understand, it would be painful and it would probably cause us to have less space activity in our Defense programs that we desire, but we could handle it.

The near-term issue, though, raises the question of the instability that Dr. Mark points out. It is just an unwise management procedure to jerk these costs around at this period of time, especially when it is for bookkeeping purposes.

Senator **Huddleston**. Let me refer to another point, then.

Senator **Schmitt**. If the Senator would yield.

We are not talking about bookkeeping, we are talking about whether or not NASA is going to subsidize the Department of Defense over the next few years to the tune of $2 billion.

I realize you all have not agreed on those numbers, but they are NASA numbers from which those calculations come, and so far nobody from either one of your agencies has refuted them. We will continue to work the problem.

But it is more than just bookkeeping. It has to do with whether NASA is going to be able to carry out the function of the Space Act, that is what it has to do with.

LAUNCH EFFICIENCY

Senator **Huddleston**. Well, it gets back also, to the standpoint of the taxpayer. Are we talking about actually more cost, assuming we have the same number of launches, if we change the procedure? Whether NASA is paying for it or whether DOD is paying for it, it is all coming out of the taxpayer's pocket. Which way is most efficient?

Dr. **Cooper**. Typically, again you have to look at the individual project and what might happen to a project manager who recognizes today that instead of having a launch cost of, say, $35 million in the 1984 or 1985 time period, that his program is going to be faced with a major increase.

The project manager has some latitude, and one of the options that would be open to him is to delay the launch of his spacecraft for an additional year or two in order to be able to accumulate the dollars required in the subsequent fiscal years to afford the launch.

Delaying the launch for a year or two, half-way through his space flight project, could add potentially 20 or 30 percent for that particular spacecraft. That cost increase never gets associated with this process of lack of management stability.

What we are saying is that keeping the cost of a launch stable through the planning period, which is about 5 years which also happens to be about the period of time required from conception until launch of a spacecraft is a very wise process from a management point of view.

As Dr. Mark pointed out, we can handle it from a senior management point of view in Defense and NASA. We can work with the Congress. We can probably make anything happen which you direct.

But from a real management standpoint and from the potential for cost increases, it really does not make sense and it is something that we should leave to management judgment. We should be able to adjust these prices from a management point of view to the extent that we think we can, without inducing the instabilities in the programs which Dr. Mark alluded to.

Senator **Huddleston**. Your contention is than what is being discussed or proposed could in fact increase the actual unit cost of the launches involved, the total cost.

Dr. **Cooper**. Total cost of the spacecraft and space flight program.

Senator **Huddleston**. Who is going to pay for it? The total cost will be higher than it otherwise might be.

Dr. **Cooper**. That is correct.

Dr. **Mark**. You would be introducing an element of uncertainty in the planning that could cause that effect. I would subscribe to that, yes, sir.

VANDENBERG OPERATIONS COST INCLUDED IN LAUNCH COST

Senator **Huddleston**. Refer back a minute to the credit that is given the DOD for its contributions. As I understand you, none of the construction cost at Vandenberg is factored into the rate that is being charged.

Dr. **Mark**. That is right.

Dr. **Cooper**. That is correct.

Senator **Huddleston**. That was a preagreed contribution.

Dr. **Mark**. That is right.

Senator **Huddleston**. And as far as NASA is concerned, that is not a contribution to them.

Dr. **Mark**. No, it never shows up in our budget, sir.

Senator **Huddleston**. All right. What about the operating cost of that facility, the ongoing cost?

Dr. **Cooper**. The operating cost of the facility will be included in the launch as part of the quid pro quo.

Senator **Huddleston**. On a per-launch basis?

Dr. **Mark**. On a per-launch basis. In fact, if you want to I can read you what is included in our calculation. We include the launch operations at Vandenberg and Kennedy; the flight support operations at Johnson; we include the refurbishing costs of the solid rocket boosters; and we include the cost of the external tanks because these are consumed—they do not come back.

Senator **Huddleston**. They are not reusable.

Dr. **Mark**. When you add all that up, you get a figure which you can then transform into a cost per launch.

Dr. **Cooper**. Could I add something to that, sir?

Senator **Huddleston**. Certainly.

Dr. **Cooper**. The fact is that the difference between what Defense pays for a launch and what a commercial organization pays for a launch——

Senator **Huddleston**. That was what I wanted to know.

Dr. **Cooper**. We recognize the fact that Defense will actually pay for the operating cost of Vandenberg out of Defense appropriations. NASA will pay for operations at Kennedy Space Center.

Consequently, we recognize that that was part of the management principles that we used to establish the Defense price per launch. Recognizing that contribution, that budget contribution to operations at Vandenberg was one of the principles that caused us to reduce the reimbursement per launch to Defense over reimbursement for, say, a commercial user.

Senator HUDDLESTON. Well, what about the commercial launches from Vandenberg; does Defense get any credit for those launches?

Dr. COOPER. They are considered in the quid pro quo.

Senator HUDDLESTON. But it all goes to NASA.

Dr. COOPER. The money goes into NASA's reimbursement.

Senator HUDDLESTON. And what about DOD launches from the east coast?

Dr. COOPER. Defense's launch operations costs from the east coast are essentialy off-set by NASA. That is, we pay a reduced launch cost from Kennedy Space Center over what it costs NASA to support the average launch over that 12-year period of time. But that reduction is in recognition of the fact that Defense will be paying for launches out of Vandenberg which are non-Defense launches.

It was that basis upon which that downward adjustment, or at least part of the downward adjustment, in the Defense launch costs was based.

Senator HUDDLESTON. Thank you, Mr. Chairman.

Senator SCHMITT. Thank you. We are going to have to recess in a moment to to vote.

But I think, Dr. Cooper, you ought to once again recognize that the quid pro quo agreement that you more or less just described has changed. The manifest has changed and there are almost no launches out of Vandenberg, whereas there is actually one more launch out of Kennedy than in the original manifest.

Dr. COOPER. We understand that, Mr. Chairman, and that is at least in part the basis for the renegotiations which are going on today.

I want to caution you, though, that I believe that in the outyears there will be much greater use of Vandenberg as a launch facility for commercial and perhaps civil launches. I think the potential there is very great and we are in somewhat of a quandary as to try and understand what that potential is and to estimate it in some way for inclusion in our long-range planning. That is, to include that as some factor in establishing the actual price per launch that we should expect from Vandenberg over that period of time.

Senator SCHMITT. Well, if you are in a quandary I do not think we can use that. I believe it too. I think the Department of Defense is going to discover, and NASA is going to discover, and the President is going to discover—some President—that in fact we ought to be out in space in a big way. But we have not discovered that yet.

Dr. COOPER. That is one reason why we urge you not to be so pessimistic about the outcome of this price per launch over the 12-year period.

VIABILITY OF NASA

Senator SCHMITT. What I am pessimistic about is the viability of NASA in the next 2, 3, or 4 years. That is what I am pessimistic about.

Dr. MARK. Mr. Chairman, Vandenberg is not in bad shape. May I continue on that after you come back from your vote?

Senator SCHMITT. We will be back in about 10 minutes.

Dr. MARK. Thank you.

[Whereupon, a short recess was taken.]

Senator SCHMITT. The hearing will come to order.

Dr. Mark, I believe I interrupted you just as we had to go vote. If you remember what you were saying, feel free to continue.

Dr. MARK. Mr. Chairman, I think the question that you have—and it is a very important one—is the effect that a program such as the Shuttle has on the ability of NASA to fulfill the other provisions that are in the Space Act and that might be important for purposes of national security, scientific research, and space applications.

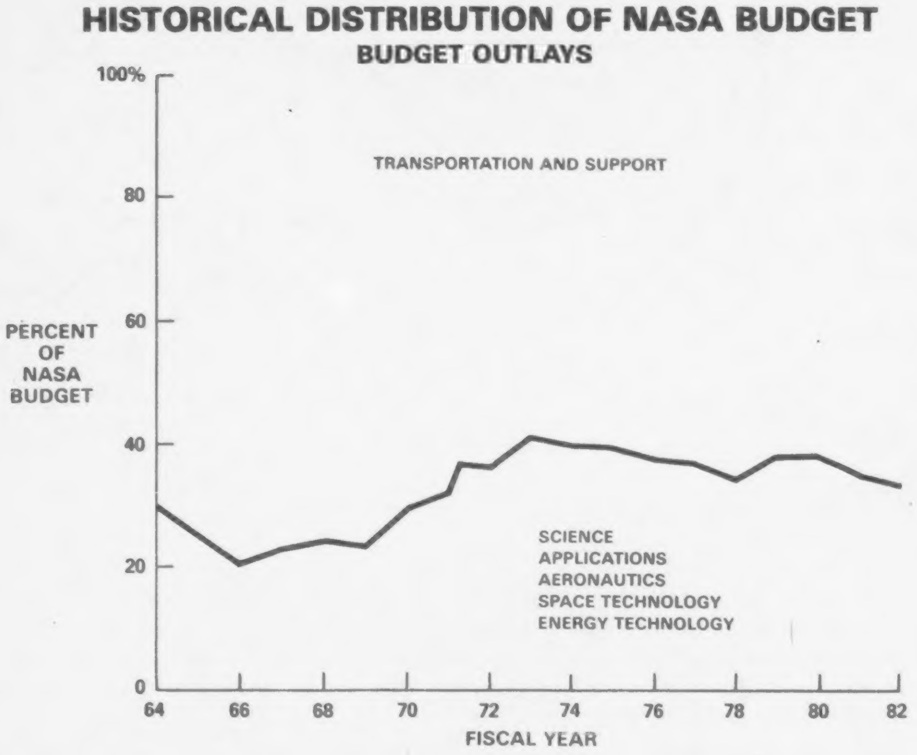


CHART A

PERCENTAGE OF NASA FUNDING

Let me start by showing a curve (chart A) that lists the percentage of NASA funding for programs other than the large programs, and it goes back to 1964.

Here is what the curve looks like. These years are the peak spending years in Apollo. During those years, we spent approximately 30 percent or so of our funding on aeronautics, on science, on applications, and other things.

The 20 years from 1962 to 1983 are the Shuttle years. Roughly speaking 40 percent, quite constantly, goes to things that have nothing to do with the Shuttle.

Senator Schmitt. Those are noninflated dollars, right?

Dr. Mark. These are percentages, there are no dollars there. This is the percentage of spending and therefore you do not have to worry about inflation.

It is certainly true, sir, that individual programs within the non-Shuttle programs have fluctuated, and I put those on this graph.

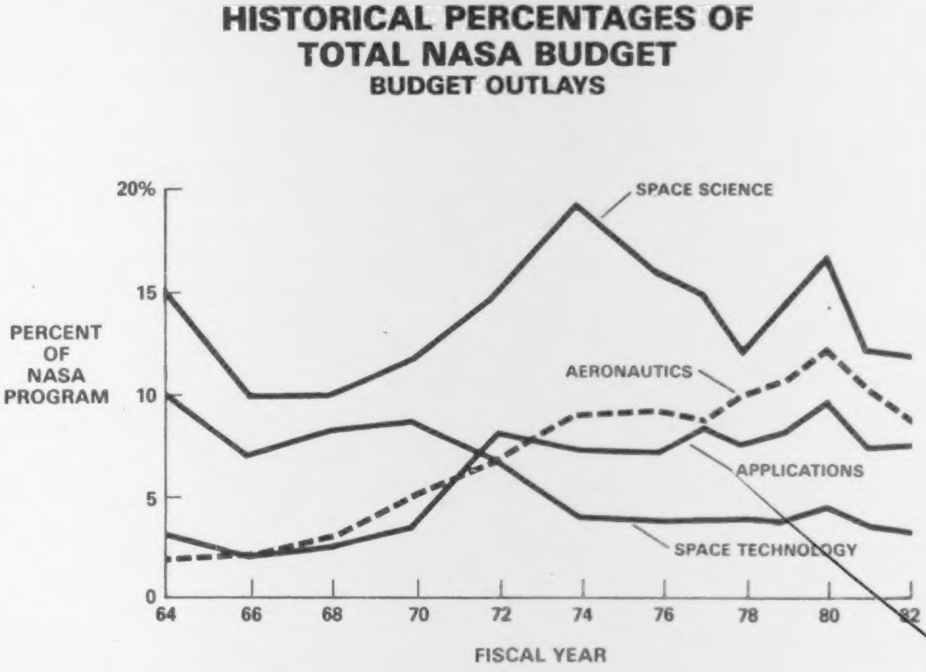


Chart B

You can see that, for example, aeronautics has gone up since 1964; space technology has gone down a little bit; applications have grown, and science fluctuates with the big missions. The peak for Viking was in 1974, and then we had another peak for Voyager. I will submit these for the record, sir.

I would also like to include the figures on which these charts are based because curves are misleading.

Chart C

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Historical Summary of Outlays by Budget Activity by Appropriation
(Millions of Dollars)

Budget Activity	Appropriation	FY 1959	FY 1960	FY 1961	FY 1962	FY 1963	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Trans. Qtr.
Space Flight	R&D	8.3	101.5	210.4	404.2	1,178.4	2,251.3	2,874.1	3,540.0	3,241.3	2,809.3	2,520.9	1,943.6	1,599.3	1,484.1	1,324.8	1,290.8	1,294.5	1,515.9	406.4
	CoF	---	---	5.2	56.1	159.6	331.6	401.0	391.5	171.6	68.9	27.0	14.5	8.1	12.9	5.1	25.2	35.0	66.5	13.3
	R&PM	2.4	11.8	63.2	104.3	178.5	195.9	276.3	330.9	326.2	317.1	322.5	337.8	341.4	350.7	329.1	328.3	315.4	350.4	88.7
	Total	10.7	113.3	278.8	564.6	1,516.5	2,778.8	3,551.4	4,262.4	3,739.1	3,195.3	2,870.4	2,295.9	1,948.8	1,847.7	1,659.0	1,644.3	1,644.9	1,932.8	508.4
Scientific Investigations in Space	R&D	21.8	107.2	180.0	296.5	410.5	537.1	560.5	522.8	490.9	390.7	281.1	339.1	298.0	396.5	570.1	493.9	464.5	504.5	117.0
	CoF	1.0	11.1	23.1	19.6	23.2	38.3	22.9	21.5	13.9	7.6	6.6	7.6	2.2	2.4	10.3	10.9	8.4	9.7	2.0
	R&PM	1.8	6.6	28.8	43.1	49.6	54.8	65.2	67.5	78.6	76.8	78.8	91.5	90.4	109.0	117.3	121.2	126.6	107.0	25.9
	Total	24.6	124.9	231.9	359.2	483.3	630.2	648.6	611.8	583.4	475.1	366.5	438.2	390.6	507.9	697.7	626.0	599.5	621.2	144.9
Space Applications	R&D	.2	5.4	12.6	53.4	82.9	99.9	75.4	101.5	102.7	102.7	92.4	105.2	170.5	224.5	185.9	162.7	152.0	187.7	60.4
	CoF	---	---	---	---	---	1.3	2.0	1.6	.3	---	---	---	1.5	3.6	.5	1.1	---	.1	---
	R&PM	.7	3.0	4.1	7.3	9.5	11.2	11.6	10.5	18.8	23.0	21.2	26.0	34.0	46.4	58.1	69.7	71.8	78.0	18.0
	Total	.9	8.4	16.7	60.7	92.4	112.4	89.0	113.6	121.8	125.7	113.6	131.2	206.0	274.5	244.5	233.5	223.8	265.8	78.4
Space Research and Technology	R&D	2.4	13.7	20.8	41.9	154.8	264.8	259.2	243.0	253.4	246.7	210.2	201.3	173.2	142.2	105.2	72.2	72.8	81.6	20.7
	CoF	4.6	13.3	13.6	22.7	24.2	49.8	53.2	39.9	32.8	20.6	14.3	13.0	1.9	1.5	.1	.2	.1	1.2	---
	R&PM	14.2	25.4	52.3	94.6	123.5	87.3	142.0	122.5	124.3	122.1	119.8	113.8	96.9	84.8	60.8	58.7	59.8	54.2	14.1
	Total	21.1	52.4	86.8	159.2	302.5	401.9	454.4	405.4	410.4	389.4	344.3	328.1	272.0	228.5	166.1	131.1	132.7	137.0	34.8
Aeronautical Research and Technology	R&D	.3	2.6	3.1	1.7	5.5	24.3	28.4	42.7	47.7	71.7	82.6	84.0	98.7	102.9	110.0	147.2	172.1	178.4	47.5
	CoF	19.2	14.2	8.3	2.6	1.6	.9	.3	4.0	2.2	4.1	6.9	4.9	4.1	6.4	6.7	8.8	6.8	8.3	1.4
	R&PM	67.3	55.0	39.2	26.8	28.5	44.5	59.2	58.4	68.7	72.8	79.0	99.0	106.8	117.6	124.9	135.9	137.0	146.1	33.9
	Total	86.8	71.8	50.7	31.1	35.6	69.7	87.9	105.1	118.7	148.6	168.5	187.9	209.6	226.9	241.6	291.9	315.9	332.8	82.8

Energy Technology Applications	R&D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.7	7.5	7.5	6.4
	R&PM	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.5	10.4	16.1	3.1
	Total	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.2	17.9	23.6	9.5
Supporting Activities	R&D	.8	10.5	19.0	53.4	84.2	140.0	186.9	291.1	351.2	325.0	343.0	318.4	290.7	273.0	245.4	253.1	257.0	273.2	72.3
	CoF	---	15.8	47.8	13.3	16.7	15.8	51.4	113.9	67.9	24.9	10.5	14.3	25.9	23.5	22.0	28.9	35.0	35.1	9.1
	R&PM	.6	3.9	12.6	15.5	21.2	22.3	23.3	29.7	33.1	39.7	34.9	39.1	38.3	40.9	38.9	41.2	39.8	47.5	11.2
	Total	1.4	30.2	79.4	82.2	122.1	178.1	261.6	434.7	452.2	389.6	388.4	371.8	354.9	337.4	306.3	323.2	331.8	355.8	92.6
Total Outlays by Activity (Program)	R&D	33.6	240.9	446.0	851.1	1,916.3	3,317.4	3,984.5	4,741.1	4,487.2	3,946.1	3,530.2	2,991.6	2,630.4	2,623.2	2,541.4	2,421.6	2,420.4	2,748.8	730.7
	CoF	24.8	54.4	98.2	114.3	225.3	437.8	530.9	572.4	288.6	126.1	65.3	54.3	43.7	50.3	44.7	75.1	85.3	120.9	25.8
	R&PM	87.1	105.7	200.1	291.6	410.8	415.8	577.5	619.4	649.9	651.5	656.2	707.2	707.8	749.4	729.1	759.5	760.8	799.3	194.9
	Total	145.5	401.0	744.3	1,257.0	2,552.3	4,171.0	5,092.9	5,933.0	5,425.7	4,723.7	4,251.7	3,753.1	3,381.9	3,422.9	3,315.2	3,256.2	3,266.5	3,669.0	951.4
Adjustments (Comparative budget structure to appropriation basis)	R&D	.4	14.7	41.0	84.5	392.1	No comparative-type adjustments applicable to subsequent year budgets									---	---	---	---	---
	R&PM	-.4	-14.7	-41.0	-84.5	-392.1										---	---	---	---	---
TOTAL OUTLAYS BY APPROPRIATION	R&D	34.0	255.6	487.0	935.6	2,308.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	CoF	24.8	54.4	98.2	114.3	225.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	R&PM	86.7	91.0	159.1	207.1	18.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Total	145.5	401.0	744.3	1,257.0	2,552.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---

NOTES:

1. Details may not add to totals because of rounding.
2. Trust funds and adjustments for proprietary receipts are not included.
3. Budget Activity titles are those shown in the FY 1978 President's Budget.
4. R&D amounts in Activity 1 for FY 1974 and prior years reflect the transfer of the subactivity Expendable Launch Vehicle Development and Support from Activity 2 to reflect for comparability purposes the change in organizational responsibility for unmanned launch vehicles. (Other changes in program responsibility involving minor amounts have not been made).
5. Budget outlay totals, adjustments, transfers and appropriation totals are consistent with amounts shown in the "actual" column of the respective Budget Documents and subsequent reprogramming actions are NOT included.

AMENDED BUDGET
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Summary of 1982 Budget Recommendations
by Budget Activity by Appropriation

OUTLAYS

Budget Activity	Appropriations	FY 1977	FY 1978	FY 1979	FY 1980	Est. FY 1981	Est. FY 1982
Space Transportation Systems	R&D	1,736.4	1,835.4	1,789.1	2,140.7	2,544.0	2,992.8
	CoF	56.6	56.0	41.3	38.5	32.4	26.9
	R&PM	377.5	368.6	386.4	414.5	444.9	467.3
	Total	2,170.5	2,260.0	2,216.8	2,593.7	3,021.3	3,487.0
Scientific Investigations in Space	R&D	471.6	355.4	460.6	548.5	492.8	557.0
	CoF	2.9	8.0	7.1	3.1	3.1	2.9
	R&PM	110.1	114.7	118.7	135.5	135.8	137.8
	Total	584.6	478.1	586.4	687.1	631.7	697.7
Space and Terrestrial Applications	R&D	237.2	204.8	269.4	320.8	313.0	358.7
	CoF	---	---	1.3	1.7	---	---
	R&PM	89.9	95.2	109.1	116.3	124.1	135.1
	Total	327.1	300.0	379.8	438.8	437.1	493.8
Space Research and Technology	R&D	84.3	90.1	86.2	109.3	107.9	121.7
	CoF	.7	.6	.3	---	---	---
	R&PM	64.0	61.1	67.0	76.1	78.1	81.2
	Total	149.0	151.8	153.5	185.4	186.0	202.9
Aeronautical Research and Technology	R&D	181.2	212.3	231.5	256.7	266.1	244.8
	CoF	7.8	18.9	35.0	59.6	65.6	57.8
	R&PM	155.3	166.5	176.8	192.4	205.4	213.1
	Total	344.3	397.7	443.3	508.7	537.1	515.7
Energy Technology Applications	R&D	5.7	18.2	9.2	5.0	2.2	1.0
	R&PM	20.9	23.7	24.3	29.1	28.3	29.7
	Total	26.6	41.9	33.5	34.1	30.5	30.7
Supporting Activity	R&D	264.3	272.5	292.8	320.4	325.9	352.4
	CoF	36.9	40.8	47.7	37.4	55.3	65.9
	R&PM	42.0	40.4	42.7	46.0	49.1	49.1
	Total	343.2	353.7	383.2	403.8	430.3	467.4
Total Outlays	R&D	2,980.7	2,988.7	3,138.8	3,701.4	4,051.9	4,628.4
	CoF	104.9	124.3	132.7	140.3	156.4	153.5
	R&PM	859.7	870.2	925.0	1,009.9	1,065.7	1,113.3
	Total	3,945.3	3,983.2	4,196.5	4,851.6	5,274.0	5,895.2

So, I have collected the entire spending history of NASA back to 1959 and I have broken them down in terms of manned space flight or Shuttle, scientific investigation, space application, space research and technology, and aeronautics. By looking at this, you can see that even though the inflationary rate changes and the percentage that we have spent on the other activities which are mandated by the Space Act, that we have actually maintained a constant figure of around 40 percent during the entire program.

FUTURE OF NON-STS PROGRAMS

Senator SCHMITT. Dr. Mark, I appreciate that, but beginning in 1980 there is a steady decline. Inflation has to be taken into account. There have been no significant new starts except for the large space telescope, Landsat is almost a thing of the past. The communications budget is being decimated; the aeronautics budget is only now in support of Defense programs for the most part.

I am overgeneralizing, but there are some serious problems in the non-STS portion of the NASA budget as it is projected out from 1980 beyond.

That is really the issue here. We are not talking about the past, we are talking about the present, what is the Shuttle launch cost.

Dr. MARK. I do not believe that the future in this sense will be very much different from the past. I think that the space telescope is a major investment. We have in fact, in fiscal years 1982 and 1983 increased our science spending from $580 million to $680 million, that is a $100 million, about 18 to 20 percent of the science budget.

I think it is obvious, Mr. Chairman, and you know we agree on this, we can always want more.

Senator SCHMITT. It is not a question of wanting more, it is a question of whether we are doing enough. We have no planetary program; we are not analyzing the data; we are cutting back. Most of the people who used to work in space science programs in the academic community have no graduate students or very few working in this area. We are not fulfilling that portion of our obligation.

Hans, it is not working, and that is the problem. We are searching for a solution to make it work. I do set aside and recognize a large space telescope, hope we can maintain it as an extraordinarily important thing.

But just because these other programs are not going to fit into the category that will win Nobel prizes does not mean that they are not good science. The fact is, there is an obvious bias in the kind of science that gets considered for Nobel prizes, and we have to remember that that is not the end-all of science.

Dr. MARK. It is not.

Senator SCHMITT. And the other side of the house is just not doing very well. There are no new starts. The French are targeting the communications and other satellite world. The Japanese and French are targeting the remote sensing world. We are losing the game.

Dr. MARK. I would have to take issue with the statement on new starts. We do have the Gamma Ray Observatory in the budget which is a new start. With respect to both communications and aeronautics, we have made significant progress in our debate within the administration and I would be remiss, Mr. Chairman, if I did not at this point say that the pressure that the Congress put on us was very helpful in that. But, these things, important as they are, are very much smaller in terms of the effect that it would have on NASA's program than what you are proposing.

EUROPEAN CONTRIBUTION TO SHUTTLE PROGRAM

Senator SCHMITT. Can you tell me what the contribution of the European Space Agency is to the Shuttle program through Spacelab? Do we have estimates of that kind?

Dr. MARK. Yes. The contribution of the European Space Agency to the Shuttle program in the past 5 years has been, in round numbers, about $1 billion. Spacelab has come in at a little under a billion dollars.

Senator SCHMITT. So, there are others beside the Department of Defense contributing to these activities.

Dr. MARK. Yes, sir.

VALUE OF USING SHUTTLE VERSUS EXPENDABLES

Senator SCHMITT. Have you in any of your discussions with the Department of Defense tried to place a value on launching of the Shuttle relative to capabilities that do not exist with an expendable booster?

Dr. MARK. Yes, sir. We are in the negotiations.

Senator SCHMITT. Nobody has mentioned that today. There is a tendency to compare Shuttle with expendable boosters. But NASA's principal argument for the Shuttle development was, you can do other things.

Dr. MARK. That is an excellent point. Part of our discussions, dealt with defining what standard and nonstandard services are in a Shuttle launch. That discussion is related to what is unique about what the Shuttle can do and what is not unique. The negotiations are not complete, so I cannot tell you what the outcome will be. But I can tell you that we have taken that into account, yes, sir.

Senator SCHMITT. Was there any value estimated for that in the 1977 agreement?

Dr. MARK. No, sir, nor in the 1980 agreement which I signed. I would say between 1972 and 1980 the view was that the Shuttle would be treated like another launch vehicle and that we would minimize the interfaces that payloads would have with the Shuttle.

One of the things I accomplished when I was at the Pentagon was to change that view. In fact, now the view is quite different. I think Mr. Aldridge is more qualified than I am to talk about that but we now have in California a group which is planning to do precisely what you said, namely to take advantage of the unique features of the Shuttle in the flights they conduct for the national security by manning them and by having manned payloads.

The next flight that is going to be launched in 2 weeks will have an Air Force payload where we will do the first experiments to see how that will work.

Senator SCHMITT. Do you agree that the project managers who somehow entered this discussion this morning are generally thinking in terms of costs, Shuttle versus expendable launch vehicles, rather than, "How do I use the Shuttle to improve my program?"

Dr. MARK. I think that statement was true up until 2 years ago. I think today, for example, a fair fraction of the payloads we are planning are actually designed from the ground up to be refurbishable and retrievable. That is of course something that can only be done with the Shuttle.

Mr. ALDRIDGE. I think what Hans has already mentioned is exactly true. I do think, however, not to put too rosy a picture on it, there is a great pressure from program managers. I feel it by having responsibility to the Department of Defense and to the taxpayer to look at what are the cost-effective solutions.

Another problem we have with this proposal is that you are forcing us to make some near-term decisions. We have to look where are the cost-effective solutions. If we start looking at Shuttle ride costs of $250 million a copy, there will be pressures on me to look at other solutions to that problem.

Senator SCHMITT. You mean those pressures are that you can choose to ignore the fact that somebody is paying those costs, even if it is not your project manager?

Mr. ALDRIDGE. The taxpayers are paying the cost.

Senator SCHMITT. That is right.

Mr. ALDRIDGE. Independent of whose budget they are in.

But when you move money from DOD and force me as a program manager within the Air Force to go look for where those funds are going to come from, I have to make some choices because you have not told me where the money is going to come from. I have to go look.

As Dr. Cooper has mentioned, we will look in the space program; we will look outside the space program; we will look within the Shuttle program.

Senator SCHMITT. We will help you in that search but the point is, it is a question of administration policy, it is across agency boundaries. Who is going to budget these costs? The costs are there.

Now, we may argue about whether it is $409 million or $209 million, or whatever it is, but the costs are there. And I think everybody admits that NASA is bearing heavier costs up front than they would otherwise later on, provided you had a fair pricing policy. I am not sure you have it, but even assuming you do.

Mr. ALDRIDGE. We knew when this program was started that the near-term cost of the Shuttle would be subsidized by NASA for military, civil, and commercial users. We are not about to go out and charge $250 million to a commercial user for the first few Shuttle flights.

Senator SCHMITT. I think we have to distinguish between the costs incurred within the Federal Government versus those incurred outside.

Mr. ALDRIDGE. I understand that.

Senator SCHMITT. I do not have any problem with that.

Mr. ALDRIDGE. It appears that your proposal is that we will all pay a fair share, and we fully support that, we should pay a fair share. This is a national program, it should be supported by the

American people and taxpayers, and every agency that flies on the Shuttle should pay their fair share—so should commercial users.

But I do not think your proposal is to charge commercial users $250 million a shot. Yet, you are charging us.

FAIR ALLOCATION OF SHUTTLE COSTS

Senator **Schmitt**. But you are not a commerical user. I just hope and insist that we keep that issue separate from the question of the DOD. You are not talking about two businesses working together. NASA does not make a profit, DOD does not make a profit.

Dr. Cooper on occasion likes to talk about business arrangements, but we are not talking about businesses. When it is to the DOD's advantage, you talk about good business relationships and when it is not, you do not—as per Senator Proxmire's question about whether you are willing to pay interest on the deferred cost.

I really think we have to be realistic about how we can best serve the national interest by a particular pricing policy—whether that pricing policy is an average over 6 years as in the 1977 agreement with full cost subsequent, or whether it is over 12 years. The point is, what is the right cost to be allocated.

Nobody has proved to me yet that you know what the right costs are, that they are in fact fair allocations of costs.

Dr. **Mark**. Mr. Chairman, we do have figures that are based on the learning curve, that we have submitted to you, based on various mission models. These are actual operations costs that we will recover over the time of the mission model.

The issue of stability is one of providing the people who have to do the work with a secure enough future so that they do not call me up on the phone every morning and say, "What do we do next?"

Senator **Schmitt**. Dr. Mark, I am all for that. Whether it is an average cost or whether it is a cost that is based on your projections, or whether it is a declining cost based on your projections, there still can be stability. A curve does not have to be straight to be stable.

I should not be lecturing you on mathematics and I do not intend to.

Dr. **Mark**. But if you have a declining cost, then you have the problem that Dr. Cooper mentioned. If you do not flat price it, then people will delay launches for no good reasons and will put the costs from one bucket into another.

Senator **Schmitt**. It would be my assumption that the launch is based as much on its need as on what price you are going to pay for that launch.

Dr. **Mark**. The two are connected.

Senator **Schmitt**. There is a trade-off between those two things and I would expect good management to be able to exercise it.

Dr. **Cooper**. Mr. Chairman, I think our objection mainly is that change on this side of the planning horizon is deleterious to good management of space programs. If we want to talk about a 1987 to 1992 time period and a major change in the policy or major change in the principles upon which the pricing was established, we would agree that we could consider that.

But I believe in the near term it is disruptive of programing.

Senator **Schmitt**. Doctor, you are making a change. You are renegotiating with NASA a pricing policy and I presume the quid pro quo is going to change because the manifest has changed. So, that instability, if it exists, is already in the system.

Dr. **Cooper**. We are not doing that exactly, we are maintaining the policy and we are reestablishing the price.

MANIFEST CHANGES

Senator **Schmitt**. How can you maintain a policy that is no longer valid on the basis of the manifest?

Dr. **Cooper**. The policy is still valid. The principles upon which we established the price orginially, that is that there should be relatively stable and uniform pricing over long periods of time and that the recovery period should be 12 years, those principles we would submit should be maintained.

The things that have changed are some of the current estimates of what the costs will be of operations. We are trying to take those into account, and we think we can take those into account in a nondisruptive way by using management prerogatives. That is really all we are saying. We do not need your help, we think we can manage it.

Senator **Schmitt**. Well, you are going to get our help one way or the other.

Doctor, I would submit for the record a copy of the 1977 agreement, and you have just gone on the record as saying only pricing is going to change, I do not see how that is possible.

In this document, "It is agreed that the DOD should pay a fair-share price to have payloads placed in orbit by the Space Transportation System."

And what the basic discussion here is, what is that fair-share price?

Dr. **Cooper**. Right.

Senator **Schmitt**. Whether it is a price per launch at full cost on a declining scale or whether it is an average over some period of time. It indeed on that same page goes into the quid pro quo and it says, "These services are projected to be approximately equal value to each agency." We already established for the record that at least the manifest has changed, if nothing else.

So, I do not see how you can leave that policy in place without at least discussing the changes. Again, in item No. 3 in this agreement on page 2 it says, "The DOD should be charged a fixed price for the first 6 years of operation."

Now, you have been talking 12 years today and that sounds like a policy change.

Item (b), "The initial 6-year price per launch should be a realistic projected materials and services cost per launch average over the first 6 years." Again, 6 years is the figure and not 12.

We need to know what it is going to be in the new agreement.

"For launches after the first 6 years of operations the price to DOD will be adjusted annually based on actual cost projected each year for materials and services." Is that going to change?

Dr. **Cooper**. I think the principles will remain the same. What our intention was there and the principle upon which those policies were established and those specific provisions were established was that we would break even in 12 years on the operating costs.

Senator **Schmitt**. It sounds like you are going to be able to break even in 6 years.

Dr. **Cooper**. No, no.

Dr. **Mark**. No, no.

Dr. **Cooper**. The price was established for 6 years.

Senator **Schmitt**. And then a changing price in the last 6 years.

Dr. **Cooper**. The price was established for 6 years, and the objective was to break even in 12 years. Now, the only thing that has really changed is some of the near-term cost. So, what we have been doing in our negotiations with NASA is going back and looking at the elements of cost.

Senator **Schmitt**. But Doctor, the manifest has changed. Vandenberg is not going to be available when it was originally established. NASA has completed its obligations at KSC and to develop the Shuttle. The Air Force has not completed its obligations.

You cannot say that the environment has not changed.

Dr. **Cooper**. No; the environment since 1977 has changed. The initial operating capability of the Shuttle is also delayed. The initial operating capability on the west coast is delayed a similar amount—and for reasons of necessary availability. That is, the expectation of when the user requires the availability.

So, I think that the thing that I tried to imply in answering your question in the short term was that we are revisiting the same principles that we used to establish the original price to see what adjustments need to be made now in order for us to be able to achieve our management goal, which was to break even on those operating costs in a 12-year period of time.

Senator **Schmitt**. Doctor, I really think you had better have your people take another look at the agreement. It just does not seem to me, nor do I think would it seem to any objective reader of this, that you can maintain the same principles and just adjust the price.

You indicated that the pricing policy was a 12-year policy to recover cost over 12 years. But that is not consistent with what is in this agreement.

Item (d) is, "For launches after the first 6 years of STS operation the price to DOD will be adjusted annually based on actual costs projected each year for materials and services." That does not imply a surcharge or a recoupment because you either underpaid or overpaid in the first 6 years.

Dr. **Cooper**. We recognized when that agreement was made that probably around half-way through the period of time we would have to make some adjustment, according to experience, in order to achieve the 12-year break-even point. The price that was established was on this 12-year basis.

INCENTIVES FOR REDUCING SHUTTLE OPERATION COSTS

Senator **Schmitt**. Dr. Mark, you have alluded to and described in other places the plans you have for reducing the operational costs of the Shuttle. I am personally optimistic that the kinds of plans that at least I have heard about that you may institute for contract management of various operations at the Cape Kennedy, some of the ideas for management and so forth, will in fact reduce those costs significantly. We do not know how much, the learning curve only has a point or two on it right now. But all trends are favorable.

There has been some DOD criticism that you have no incentive to reduce costs if we would require full-cost reimbursement. Do you agree with that?

Dr. **Mark**. Mr. Chairman, we would have an incentive to reduce costs because of our commercial operations as well. I think that the incentive is there either way. However, I think that the difficulties that would be faced in rearranging our relationship with the DOD with respect to Vandenberg, with respect to what we tell their project managers and so on, would be, from my point of view, very, very difficult to deal with. So, even though we continue to have the incentive to reduce costs, I would not welcome the change that is being proposed.

Senator **Schmitt**. I am not asking you to welcome it, I just wanted to be sure that that was not left on the record that you would have no incentive to reduce costs if the pricing policy of DOD might be altered.

Dr. **Mark**. That is not so.

DECLINE OF REAL VALUE IN CONSTANT DOLLARS

Senator **Schmitt**. Now, we already discussed the question of science applications and other civilian aspects of the space program. There has been one new start in the past 3 years, Gamma Ray Observatory. There are many other programs that have been on the drawing boards on the verge of being requested over the last few years, but they have either been withdrawn or just are still on the drawing boards.

You mentioned that the percent for the civilian space program as a function of the total NASA budget has remained reasonably constant at about a 40-percent level. The charts have been submitted for the record.

But when you look at the real value in constant dollars there has been a decline of 24 percent since fiscal 1980.

Dr. **Mark**. That is true of the Shuttle program, sir.

Senator **Schmitt**. I am not arguing the Shuttle, I am just saying that the nontransportation side of NASA has been declining and has reached a point in some areas where there is a real question of whether there is going to be a program that is competitive with not only what is happening abroad, but that meets clear national needs—including some that feed into the Defense program, such as communications technology and aeronautics, although there seems to be a general consensus that the NASA aeronautics budget has been protected to the satisfaction of DOD, if not to the satisfaction of others.

Dr. **Mark**. We have recently proposed an increase in the aeronautics budget as a result in discussions with Members of the Congress. We are not inflexible on these issues.

HEALTH OF CIVILIAN SPACE PROGRAM

Senator **Schmitt**. You are then saying that the civilian space program is not in serious trouble; is that correct?

Dr. **Mark.** I think the civilian space program is not in serious trouble; however, it has problems. We have a particular problem in the planetary program. But, may I point out, sir, that one reason we have that problem is that in contrast to the commercial launch programs and the DOD launch programs for our own scientific programs, NASA decided in 1975 or 1976 not to provide backup vehicles to the Shuttle.

The reason we have a problem today in the planetary program is because we had to delay the Galileo launch when the Shuttle was delayed. Had we kept a Titan backup for Galileo, it could have been launched this spring, in 1982; and now we are working on something else. By delaying that launch, we increased the cost of the planetary program as always happens when something is delayed. In addition, it is harder to get a new start through the system when you were still working on the major program.

Not providing the backup, I believe—looking back on it with 20-20 hindsight—has been the real problem in the planetary program and that we have not followed the same backup policies in the scientific programs that we followed in the military and the commercial programs. We do have a problem there. I can tell you what we are trying to do in order to fix it. The committee, chaired by Noel Hinners, to look at the question of solar system exploration for the next 10 years is going to propose the adoption of a philosphy for the planetary program that is similar to that which we have applied in the Explorer program of Earth-orbiting spacecraft. That means missions that are not designed to do all the possible measurements in a given area of the solar system, but targeted missions that can be executed for costs that may be something on the order of a quarter or a third of what we are now paying for a major planetary mission.

So, I expect a restructuring of the planetary program based on that philosophy. I am second-guessing the committee a little bit here. I do not want to guarantee that; but, I think that is what will result from the deliberations of Dr. Hinner's committee.

NASA'S MANAGEMENT AND TECHNICAL EXPERTISE

Senator **Schmitt.** I wish I could be as comfortable as you seem to be about the health of the civilian space program. There is no space policy as yet. I realize it is being discussed. We will see what turns out.

We have no new program starts that I am aware of that are projected. Our technical manpower and management expertise in the agency is retiring, many of them leaving or others leaving for better salaries in industry. That is not all bad. Hopefully we can bring in new blood, rejuvenate the agency for whatever mission they may be given, if any.

Our scientific or industrial base in university and industry is not as strong as it should be in these areas. I do not think we are particularly healthy, particularly when I look at what we are facing in terms of competition.

Dr. **Mark.** One of the very interesting things that has happened recently—and your mentioning of manpower reminded me of it—is that we have been able to bring in this year about twice as many new college graduates as we brought in last year, precisely because of the phenomenon that you are talking about. As you pointed out, it is not all bad. The ability we now have to bring in new people, in spite of the fact that we have a slightly declining manpower level, is very, very large in the next 2 years. We expect to hire several hundred new fresh-out engineers.

Senator SCHMITT. Let us hope we can give them some exciting missions to undertake.

Dr. MARK. Yes, sir, I could not agree more.

Senator SCHMITT. It is not clear, if my calculations are correct, that NASA will be able to have the budgetary flexibility to undertake them.

Dr. MARK. I think we will.

AIR FORCE LONGSTANDING RELATIONSHIP

Senator SCHMITT. In NASA's procurement of Titans and use of Titans, is it true that you paid the Air Force full cost for the Titan vehicle and full costs of service for launches out of the Cape?

Dr. MARK. We have not done that for such a long time, I do not remember.

Senator SCHMITT. I am trying to explore this long-term, longstanding relationship that you have had with the Air Force.

Dr. MARK. I understand. In the case of Delta, we have a full-cost reimbursement. There the answer is very simple, Delta has been a fairly standard launch vehicle for a long time so we know what the costs are.

I would have no objection 20 years from now, Mr. Chairman, to putting the Shuttle on a full-cost reimbursement basis because I know how to do that. What I do not want to do, is do it now.

Senator SCHMITT. Apparently the Air Force did not have any problem doing that, according to the document I have in front of me, the 1977 agreement. They did not have any problem doing that 6 years from the start of STS operations.

Dr. MARK. Well, maybe 20 years is an exaggeration. But it would have to be a good way's down the line so that we really understand what the actual cost of operations is.

Dr. COOPER. On that score, you have to admit that in 1977 we really thought that we would be only 3 years away from the initial operation of the Shuttle, and we also agreed that 6 years after that we would probably have to revisit and reprice.

So, the initial agreement was really only a 6-year basis because we recognized that there was enough uncertainty in the assumption so that in order to meet our goal of a 12-year breakeven on the operating costs some adjustments would be necessary.

CHARGES FOR USE OF NASA FACILITIES

Senator SCHMITT. Well, it does not bother me that you will revisit this agreement. But you did establish the principles and I think it is fair for me to use those principles in rebuttal to your position.

There is a discrepancy, apparently, in the way the wind tunnel programs are operated. My information is that the Air Force charges NASA full cost for any use of an Air Force tunnel or laboratory facility in the aeronautics program or for any other purposes, but does not charge the Air Force for the use of NASA tunnel time; is that correct?

Dr. MARK. That is correct. It goes roughly like this: We charge full costs for the operation of our wind tunnels to commercial users. I think, in the regulations that govern the use of the wind tunnels, there is a provision that we do testing related to the national security for nothing.

Up until 1972 that was also the case with the Air Force facilities, and particularly with respect to the Arnold Engineering Development Center because that facility also was built under the Wind Tunnel Act. But it was changed in 1972 when the Defense Department adopted an internal plan of industrial funding. They internally charge their own Military Airlift Command just as they charge the Army, the Navy, or whoever.

When they went to this internal industrial funding system, the question came up, "Gee whiz, what do we do with NASA customers, can we really do something different with them than we do for our own internal people." They came to the conclusion, "No, we cannot."

We were then faced with the decision as to whether we should turn around and charge our DOD customers for the use of NASA facilities and came to the conclusion that it would be violating the tradition under which the NACA conducted its aeronautical research. One of the very important features of that arrangement is that a test of a given configuration not be distorted by too heavy of an emphasis on cost.

Let me explain that.

Senator SCHMITT. Can you bring the mike a little bit closer?

Dr. MARK. If you find a problem on an airplane which costs more to work out, there is an enormous temptation to cut corners. I saw that, for example, in a helicopter program the Army did back in the late sixties and early seventies. Do you remember the Cheyenne helicopter?

The Cheyenne was a large, large program. The Defense Department spent $2 billion on it. It was essentially the advance attack helicopter that we have now. We had four crashes of that airplane and the reason was that we did not conduct sufficient wind tunnel testing. The reason for that was that in the development program we did not want to spend the money to do it, neither did the Army.

I would hope that we could come to an arrangement with DOD where we mutually support each other's research programs in our facilities without inventing a very expensive and cumbersome accounting system.

QUID-PRO-QUO ARRANGEMENT IMPACTS NASA'S BUDGET

Senator SCHMITT. Gentlemen, I have no problem with quid-pro-quo arrangements, I think that is good management. But the way the things seem to have developed in almost every area of so-called cooperative activity, the NASA budget one way or another is bearing costs that otherwise would have been assumed by the Department of Defense—either directly or in a quid pro quo.

I think you see how this subcommittee and other committees around here are having trouble with this because we do see an inadequate effort in science and technology in this country. Anybody who thinks this country is investing either commercially, or academically, or publicly enough in science and technology, commensurate with the problems that we must tackle, just is not paying any attention.

At the same time you have to recognize that people over here see comparatively and importantly a rapidly accelerating Defense budget at the same time this seeming inequity continues with respect to budgeting, and that NASA literally is carrying some additional Defense costs within their budget—whether it is aeronautics or whether it is Shuttle.

I hope both of you know—and if you do not I have not been communicating—that in addition to supporting a strong and sustained science and technology I support the Defense Department and the Air Force. We may argue a little bit—and a lot—on some particular issues, but there is certainly no question of where my incentives are for supporting DOD's efforts to efficiently increase our national capability.

Sometimes, even without any help from you guys, we get some things done that you know we have to do.

Dr. COOPER. Mr. Chairman, we in Defense have considerable sympathy for the point of view that you express here on the space technology as well as on the Defense programs. But we really feel it is our obligation to point out to you the danger of the precedent that you propose to set in the legislation that has been outlined.

That danger is one of directly relating the science and technology programs in NASA to national security programs, proposing to essentially in effect transfer authorization and/or appropriations from the Defense budget—that is to directly affect national security programs—in order to support science and technology programs.

Now, regardless of how we as individuals feel about the efficacy of the programs involved, the precedent of establishing a one-to-one relationship between the importance or the priority of national security programs in relationship to the importance and priority of science and technology programs, is a dangerous precedent.

It leaves open the possibility that those with a lesser view and understanding of the importance of science in the overall direction that this country takes will misunderstand and, in cases where it does not apply, tend to make these comparisons and place the science and technology programs really in an unfavorable position.

So, I think the precedent of just associating a reduction in the Defense budget with corresponding science and technology programs in NASA's budget is a very dangerous precedent and one not to be established at this time in any event.

Senator SCHMITT. Even if NASA is subsidizing the Department of Defense?

Dr. COOPER. That is correct. It is a different issue.

Senator SCHMITT. It is not a different issue—it is not a different issue.

Dr. COOPER. It is a different issue in the sense that I tried to characterize it here and that is, in the dangerous precedent of making this one-to-one association between programs in Defense and their priority, their national priority and programs, scientific programs in NASA or anywhere else, and their national priority.

Senator **SCHMITT**. Well, I hope you underestimate the reasoning ability of Members of the Congress as well as members of the public in not being able to distinguish or to make the correlation between strong science and technology and a strong defense.

Since you brought this particular area up, as you know, one of the main reasons that I began to explore this alternative is that there are certain aspects of space transportation investment that NASA is not going to make or is going to make—either way—that are important to our national defense. The fifth orbiter which the Department of Defense originally supported—and if you want the quotes from the Secretary of the Air Force in 1972 and other subsequent quotes—the Department of Defense has generally supported the fifth orbiter up until very recently.

But I have not been able to get the Department of Defense to agree that they ought to put some money into a fifth orbiter to maintain the long-lead items, at least. And why? Because you all have first priority call on the first four. You do not "need" a fifth orbiter.

Dr. **COOPER**. That is not entirely the rationale.

Senator **SCHMITT**. Well, but I have had that said to me, Doctor. There is no question that you ought to have first priority on the orbiters if it is in our national security interest.

But that is not a good argument for not supporting funding in your budget or anyone else's budget for a fifth orbiter.

Dr. **COOPER**. I agree.

Senator **SCHMITT**. DOD today is not supporting NASA in getting funding for long-lead items to maintain a fifth orbiter option.

Dr. **COOPER**. I agree that the possibility that the Nation will need a fifth orbiter in the long term is high. But I think in terms of our current ability to understand national need, the general consensus in Defense is that probably all of the national need, including the Defense need, can be met marginally with four orbiters.

Senator **SCHMITT**. It cannot be met with three orbiters, and that is what you are looking at when you have only four, is the high potential of only having three.

Dr. **COOPER**. That was what I was about to say. We feel uncomfortable in that because of the problems associated with the risk of running a four-orbiter fleet.

Now, that does not mean that we are not willing to take that risk in relationship to offsetting the risk by investing Defense money in that backup fifth orbiter. We are just not able to take that step at this time.

Senator **SCHMITT**. We add to that issues related to augmentation to high-energy upper stages and everything else. As I have explored this over the last couple of years with the Department of Defense, there seemed to be absolutely no willingness to assume any responsibility on the developmental side of helping the Nation develop these capabilities.

So, the basic thing is, if you are not going to help NASA develop these national capabilities through our own budget, well, then let us make you pay higher costs so that NASA will have the resources in order to develop them from the Nation.

Dr. Cooper. But, Mr. Chairman, we are living up to our agreements on that score in developing the upper stage. We have viewed the thrust augmentation program, really, as meeting the original performance criteria of the Shuttle, which was an obligation that NASA took on and we feel, rightfully, that they have assumed the prospective cost of the thrust augmentation on that basis. That is, it is a program meant to achieve the original performance criteria that were agreed to in the basic Shuttle development and represents in essence the covering of a shortfall in performance of the program.

Senator Schmitt. Has the Air Force or DOD ever internally competed in the procurement of orbiters against other Air Force-DOD programs?

Dr. Cooper. No, sir, not to my recollection. There has been no direct comparision.

Senator Schmitt. Has it ever been discussed?

Dr. Cooper. Not in my presence. I would suspect there has been conversation about the priority that a fifth orbiter would have in the Defense programs.

Senator Schmitt. During the fiscal year 1982 budget cycle NASA's budget went from $6.7 billion in the January request to $6.1 billion in the revised March request, to a final appropriation of $5.9 billion as a result of cumulative administration reductions and congressional reductions at the request of the administration, one way or another.

This first reduction is a $600 million cut, or almost 10 percent of the NASA budget. The DOD statement last year before the Senate Commerce Committee stated that:

> During the period in late February and early March, NASA budget adjustments were under consideration. The Air Force worked closely with NASA in the Shuttle area to evaluate the potential impact of our programs critical to national security. While the amended NASA budget reduces the rate of Shuttle launches, essential DOD flights are not endangered.

The statement goes on to say:

> In summary, the reductions which NASA has made in their amended fiscal year 1982 funding request for space programs appear to have been in areas which minimize the impact of DOD programs in the short term."

Do you agree with that statement, that was accomplished in the 1982 budget?

Dr. Cooper. I believe so.

IS PROPOSED AGREEMENT QUID PRO QUO?

Senator Schmitt. Do you agree with the principles established—I may have covered that. We did cover that.

You do, just to summarize, believe that the new agreement that you are undertaking should adhere to the principle that services provided by each agency will be of approximately equal value relative to space transportation, services provided to each other, a quid pro quo?

Dr. Cooper. I agree that we will try to adhere to that principle generally. It may not be possible to do that, or there may be other considerations.

Senator **Schmitt**. It may not be possible to do that and keep the price where you would like to keep it; is that right?

Dr. **Cooper**. No. I mean as a practical matter.

Dr. **Mark**. It could very well happen for some reason or other that we cannot foresee. If the commercial world was to suddenly run its launch rate down by a factor of three, then the equation changes much more drastically than it has in the past. Now, I do not think that is going to happen.

Dr. **Cooper**. As a matter of fact, we would hope it would happen the other way.

Dr. **Mark**. In fact, it is more likely that it will happen the other way. We are in a very, very fluid period on these projections.

Dr. **Cooper**. That is why stability at this time is so important because the fluidity of the situation allows small perturbations in our policies to have enormous implications, not only within the Defense Department budget, but on the external community as well.

Their perceptions of instability can only drive them to more stable alternatives, such as the Arianne, or perhaps alternative ways of accomplishing their end goals.

USE OF EXPENDABLE BOOSTERS

Senator **Schmitt**. Well, is the analogy to that that within the Department of Defense instability drives them to expendable boosters, in spite of national policy to the contrary?

Dr. **Cooper**. Well, it is quite possible. For instance, there is a community of interest in the United States that would create commercial expendable launch vehicles. These options are being explored by some of the major aerospace industries and there are small development companies springing up, trying to create expendable launch vehicle options to the Shuttle.

Any instabilities that we might create in the Shuttle program today could well encourage these alternative launch vehicle options for commercial and other interests.

Senator **Schmitt**. And you are saying DOD does not place any value on the nonexpendable characteristics of the Shuttle?

Dr. **Cooper**. No, I am not saying that at all.

Senator **Schmitt**. Well, but at the project manager level you are implying that that value does not compensate for the basic increase in launch costs.

Dr. **Cooper**. That is an issue that we are exploring in the ongoing negotiations with NASA over the price of the DOD Shuttle launch.

Mr. **Aldridge**. Mr. Chairman, the Air Force and DOD really are fully committed to the Shuttle. There is no doubt about that. Many of our payloads are now designed to fit only on the Shuttle. So, there is never an issue of falling off the Shuttle program to go to expendables.

But there would be a question, I think, raised as to the degree by which we continue to support the Shuttle and looking at alternatives in the near term, and recognizing——

Senator **Schmitt**. You do not have a choice—I am sorry to interrupt—but you do not have a choice. It is national policy. We have all seen the Presidential Executive Order that states that national policy.

Mr. ALDRIDGE. That is correct.

Senator SCHMITT. And it is up to everyone who is concerned, including those of us over here, to make sure that Space Transportation System comes into existence at the minimum cost, operational cost with maximum capability, to serve both defense and civilian needs.

Mr. ALDRIDGE. That is correct.

Senator SCHMITT. I keep getting the impression that there is more than just a hint of a threat that somehow DOD will go off and live in another country for a while.

Mr. ALDRIDGE. Let me address that. First of all, the policy is very straight-forward, it says the Shuttle will be the primary launch vehicle for the Department of Defense and for civil use. That is absolutely correct, there is no doubt in our mind about that.

But this proposition is forcing us to make some near-term economic decisions, from the point of view of the Department of Defense and from the taxpayer to look at what are those economic alternatives to proceeding with now a much higher cost in the near term—recognizing that over the long term the Shuttle will have a very strong economic and military benefit.

But we all recognized in the beginning of this program, in the near term it was going to cost much more to launch that Shuttle than was going to be charged to the users in the near term.

Now, you are forcing us to say "in the near term" we are going to fully fund it, all right. Now we have to look at, where do those funds come from?

To my knowledge there is no proposition to add those funds to the DOD to pay for this additional cost. So, we have to go look at, what are the alternatives?

Senator SCHMITT. There may be possibilities.

Mr. ALDRIDGE. Well, up until this point it is our understanding that that will happen, so we have to go look at what those alternatives are.

Senator SCHMITT. It is not the intention of this subcommittee that if it was agreed by the Congress that this is the policy that we would follow, or some modification of it, I hope that we can negotiate other alternatives and make sure that the numbers are correct and that there is a fair pricing policy and one which does not create instabilities. Obviously, that is implicit in everything we are doing here today.

But it is the impression of many that certainly the 1977 pricing policy, and what we hear may be the 1982 pricing policy, do not represent an equitable cost repayment to NASA, even if it is averaged over some number of years. We will just have to argue that out and continue work at the staff level and elsewhere to see what those numbers really ought to be.

But whatever those numbers turn out to be, even under your new agreement, we are going to have to find some ways in the budget to increase the allocation of cost to particular programs, right? The new agreement is going to come in.

Dr. COOPER. That is correct.

Senator SCHMITT. Even that has not been considered in the course of the authorization that has passed through the Senate and is going to come.

Dr. COOPER. That is correct. It is our management objective in reaching these agreements with NASA to satisfy the principles upon which the agreements were originally made and still not exceed the management flexibility that we have in Defense to cope with increased costs.

So, there are pressures on both sides of that equation and that is why negotiations at the management level are required. We think that is the desirable way to deal with this problem.

Senator SCHMITT. Well, John Yardley, the Associate Administrator of NASA responsible for Shuttle development up until just recently stated before Congress relative to the 1977 agreement—to take another view of it—

> Since both NASA and DOD operate parts of this system and absorb a lot of the operational costs, we made an analysis of DOD traffic out of Kennedy and our traffic out of Vandenberg, and our Johnson services. We agreed that it was close enough to be a push if we would not charge them for the services of launching and flight control, and if they would not charge any non-DOD flights out of Vandenberg for those services. Consequently, our cost to DOD would be essentially the cost of tanks, solids, and other expendables for each flight. That cuts down on the bookkeeping, and I think that would be an acceptable arrangement.

That was the way NASA viewed, at least through John Yardley's eyes, the agreement in 1977.

Dr. COOPER. That is correct. If you hark back to those words and ask what did John mean when he said it is a push, what he really meant was, our exception over the 12-year period of time was that the launch costs for activity in the two places would be about the same.

Senator SCHMITT. That has changed.

Dr. COOPER. The question is, what has changed from that? Well, Hans pointed out that the thing that has changed is mainly our expectation of the Landsat and the Spacelab flights out of Vandenberg. Consequently, we have a different expectation now.

The question is, Is our expectation now any more accurate than the expectation than John Yardley had in that latter 1970 time period? Well, perhaps it is, perhaps it is not. If Landsat becomes in its new incarnation—the incarnation which will be launched within a month—a potentially viable commercial or internationally commercial asset, there may be a move in the commercial community to reestablish the Landsat program in some form and we will actually have those launches out of the west coast.

If Spacelab actually becomes a viable alternative for space processing which has commercial viability in the latter part of the 1980's, it could be quite possible that this number of Spacelab missions out of Vandenberg would actually be realized. We do not see that now, but it could be. I just want to point out that there is uncertainty there.

Senator SCHMITT. It could be, but in the first 6 years of this new agreement, Doctor, the chance that the manifest is going to change significantly in favor of launches out of Vandenberg is pretty small.

This administration has not taken an initiative as they should to develop an operational land-remote sensing system either in the Government or outside the Government. It just is not happening.

There does not seem to be any significant initiative to move in that direction.

The emphasis on space processing, if that is what you want to hang your hat on, is almost minuscule in the United States right now. There are some interesting possibilities, I am well aware of them but we are a long way from being to the point where in the next 6 years you are going to see a significant number of launches out of Vandenberg.

Dr. COOPER. I agree in 6 years, but we are looking at a 12-year planning period. Actually, the agreement is based on a 12-year planning period.

Senator SCHMITT. I am looking at the agreement I quoted to you, and I am looking at 6 years. You said the principles were not going to change. Even over 12 years, I am afraid if we continue on the track of space policy we have had recently, that my statement will still be true.

I certainly hope and pray that it will not, and I will do everything I can to change it. But the point is, there has been a major change in the manifest and we would expect that your agreement would reflect that change in the manifest.

Dr. COOPER. The change in the manifest really is through the current budget planning cycle which is 5 years. Now, the actual manifest that will obtain from our current understanding of the launch model, I think, is much less certain than that. I guess I am dismayed at your pessimism about the potential that space has.

Senator SCHMITT. Who has been more optimistic in this country than I about the potential of space?

What I am dismayed about is the attitude I see within the administration at the highest levels; the attitude I see within the Department of Defense and how fast they are going to occupy this new ocean of space and the high ground; and the unfortunate position that NASA has been forced into in not being able to ask for any significant new starts; not being able to develop an operational remote sensing system; not being able to move forward in advanced communication technologies; not being able to do almost anything that you and I know, that Dr. Mark and I have discussed on many different occasions, is part of the potential of space.

It is not happening. And unless we begin to move awfully, awfully fast and find a lot of bucks to put into these kinds of efforts, both publicly and commercially, we are not going to see it in the next 6 years.

What we have to worry about right now is, what is going to be a fair pricing policy for the next few years relative to DOD launch costs. We will continue to discuss that.

I hope that your staff and mine can work together to understand where you are headed on pricing policy. I hope you will not keep it a secret very long so that we can do the appropriate things in the budget in order to take that into account.

All we have done is looked at the numbers that NASA has provided, and what the real costs are going to be for two launches that are supposed to be paid for by DOD in fiscal year 1983. That is all we have done.

There may be argument over those calculations, but so far, to my knowledge, there has been no formal rebuttal of any kind of the calculations.

Dr. COOPER. Well, we would like to work with you to both understand those calculations and verify our understanding of the calculations.

Mr. ALDRIDGE. Sir, I think the rebuttal is mostly in the principle of it. Not that the calculations are in error, but I think it is the principle that is being argued first.

Senator SCHMITT. But you know, it is awfully hard to talk to the principle here unless we know really what kind of bucks we are talking about. I agree, we ought to have a stable pricing policy. But the one that exists now and the one that we would foresee would come out of a DOD-NASA agreement does not present stability to NASA. It may be great for DOD, but it does not look very stable from this point of view relative to the NASA civilian program.

Dr. COOPER. Well, I would ask you not to prejudge that. I think that if we adhere to the principles, that we will come out with a fair and equitable pricing policy that will meet the needs of the program.

Senator SCHMITT. When will that be?

Dr. COOPER. I would suspect that would be very shortly, within weeks.

Senator SCHMITT. Well, I do not know whether we can wait, but we will look forward to it in anticipation, great anticipation.

SUBMITTED QUESTIONS

The committee has submitted questions in writing which will be forwarded to you for response.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

ADDITIONAL COMMITTEE QUESTIONS

DEPARTMENT OF DEFENSE

SHUTTLE FUNDS WITHIN THE FY 83 BUDGET

QUESTION: Dr. Cooper, in an earlier hearing the Air Force identified nearly $930 million in Shuttle funds within its FY 1983 budget. We need to know how that figure was derived and will require a more detailed breakdown than was provided at the time. Please supply that for the record.

ANSWER: The DOD budget for FY 83 contains the following funding which is Shuttle related:

	($ in Millions)
Shuttle Development (Vandenberg, Inertial Upper Stage, Other)	$581
Shuttle Operations (Orbiter Flight Charges, Upper Stages, Operations and Maintenance of Shuttle facilities)	$516
Consolidated Space Operations Center (Acquisition)	$122
Back Up Expendable Launch Vehicles	$128
Payload Transition	$90
Total	$1437

ADDITIONAL $409 MILLION OF SHUTTLE PROGRAM COSTS

QUESTION: Under the Senate-approved version of the NASA authorization, as we have discussed, Defense would be assessed an additional $409 million of Shuttle program costs in fiscal year 1983. First, are you aware of how that figure was derived? Were the underlying assumptions fair?

ANSWER: We believe we understand how the $409M figure was derived. We do not agree that the underlying assumptions were fair. Specifically, the methodology denied DOD any credit for its ongoing investment in the National Shuttle program. If "fair" is to be appropriately applied, then all aspects of the DOD participation in the Shuttle should be considered -- not just the funds we pay to NASA for Shuttle hardware reimbursement. Further, the methodology, even if accepted, uses the cost per flight data incorrectly. Finally, the methodology as proposed would be unworkable as a budgeting guideline. The methodology assigns costs based upon a percentage of use as predicted by the mission model. The mission model is a dynamic document that changes from week to week. A "fair" budget built on the current mission model will be inequitable by the time the flights are actually flown.

ABSORB THE $409 MILLION IN AF SPACE BUDGET

QUESTION: If the Senate-passed NASA authorization were adopted by Congress, under current budget restrictions, it is likely the Air Force would have to absorb the $409 million in its own space budget. Have you analyzed that possibility? What would be the impact on other Air Force space programs? Please be specific.

ANSWER: Yes, we have analyzed the possibilities. A reduction in the AF Space Program of that magnitude would cause severe impact.

Coming at the last minute and in such an unplanned manner, the impact is markedly increased. The only option open to us will be to propose the cancellation of one or more significant elements of the military space program. No single element alone would provide the full $409M offset. Cancellation of any of the elements would have severely setback our progress toward a fully operational space capability.

REVISED COST SHARING

QUESTION: Would there be any particular problems, either for NASA or DOD, in administering the revised cost sharing if the Senate NASA authorization were adopted in its present form?

ANSWER: Yes. The revised cost sharing methodology is fundamentally flawed by the dependence upon a rapidly changing mission model to determine "fair share." What is "fair" at budget submission will not, in all probability, be equitable at execution. Further, the Senate NASA authorization approach fails to take into account the NASA/DOD partnership arrangement. Under that arrangement DOD is making significant investments and is, therefore, not "just another customer." For these reasons, both NASA and DOD support the fundamental philosophy of the existing pricing policy; i.e., hardware is funded on a per flight basis and manpower is funded by the operator of that site. Both NASA and DOD are, therefore, able to predict outlays and generate reasonably stable budget estimates.

SYSTEMS IN NASA AND DOD

QUESTION: What systems do you have in place in NASA and DOD for determining full costs of the Defense missions on the Shuttle?

ANSWER: Shuttle operations costs can be divided into three categories:

- Hardware costs (Solid Rocket Boosters, External Tanks, etc)
- Manpower (Johnson, Kennedy, and Vandenberg)
- Optional Services (non-standard equipment or services requested by the payload)

The hardware costs are reimbursed to NASA as Orbiter Flight Charges paid one year prior to flight in the amount agreed to in the pricing policy. The current pricing policy calls for DOD to pay actual costs after the first six years of operation. NASA will determine the actual cost estimate for each year and provide that estimate to DOD in sufficient time for DOD to use the estimates in its budget preparation.

Manpower costs are funded by the operator of the site (i.e. NASA funds Johnson and Kennedy; DOD funds Vandenberg). The manning of these locations will be sized to accomplish the total mission requirement at each site (as determined by the National STS Traffic Model).

Optional Services will be identified, costed, and funded separately. The Launch Services Agreement for each launch will stipulate the optional services required. The provider of the service (NASA or DOD) will estimate the cost and the payload requesting the service will fund for it.

DOD COSTS

QUESTION: At what point do the DOD costs of the Shuttle exceed those of conventional and expendable launchers? Would the additional launch funding DOD is being asked to provide be consistent with costs borne by other federal agencies as Shuttle use expands?

ANSWER: DOD costs for the Shuttle exceed the cost for expendable launch vehicles now. No, it would not be consistent. Only the DOD and NASA have invested in the Shuttle. No other federal agency is being asked to carry any of the system cost of the Shuttle. The total cost paid by DOD for Shuttle related activities is consistent with its use. The proposed increases would make the DOD charges excessive.

QUESTION: What is the status of current NASA-DoD negotiations and do they recognize all DoD costs including manpower and other launch support activities?

ANSWER: The current NASA-DoD negotiations are proceeding. We plan to address all cost elements comprehensively.

QUESTION: Do they recognize the apparent inevitability of continuing cost increases in the Shuttle Program? How?

ANSWER: The original pricing policy and proposed revisions recognize that the actual Shuttle operations costs will fluctuate. This is accommodated through the use of constant year dollars so that inflationary considerations are automatically compensated and through redetermination of cost reimbursements after an initial period of time. The present negotiations are evidence that other, extraordinary circumstances can also provide the impetus for pricing redetermination.

QUESTION: Is there any agreement to date over what percentage of the Shuttle operation will be claimed by Defense?

ANSWER: There is no agreement as to what percentage of the Shuttle operation will be utilized by Defense. For the purposes of scheduling, Defense is just another customer, albeit with priority. Our requirements are driven by programs under the cognizance of Congress. We provide our traffic projections to NASA for incorporation into the national model. Since the Shuttle is the primary means to support national security launches, the DoD percentage of the Shuttle operation will depend on the total capacity of the system as well as the demand from other uses.

QUESTION: What adjustments are considered if the current pattern of reduced civil uses continues? Will DoD be required to keep taking on an added share of the Shuttle program costs?

ANSWER: We would anticipate that civil use will in fact increase. Under any circumstances, DoD is prepared to pay its "fair share". Determination of that "fair share" is the subject of current deliberations between DoD and NASA.

LONG TERM FUNDING IMPLICATIONS

QUESTION: What are the long term funding implications of the NASA/DOD cost sharing changes proposed by the Senate approved NASA authorization and contained in the Urgent Supplemental? Please provide out-year projections for the record.

ANSWER: The long term funding implications are listed below as increases to the FY 83 President's Budget:

Millions of Dollars

	FY 83	FY 84	FY 85	FY 86	FY 87
Increase (All Programs)	400	300	450	275	400

WITHDRAWING REPROGRAMMING REQUEST

QUESTION: With the urgent supplemental mandating Centaur development, shouldn't the Air Force withdraw its $4 million reprogramming request to begin development of its own High Energy Upper Stage?

ANSWER: The urgent supplemental would result in a Centaur developed specifically for the Galileo mission. Significant modifications to the Centaur would be required to meet DOD payload requirements. If the Centaur were directed, the $4M would be required to begin the definition of the changes to the Galileo version of the Centaur in order to meet DOD payload requirements.

NASA PROHIBITED FROM MAKING NEW EXPENDITURES FOR CURRENT IUS

QUESTION: The urgent supplemental also prohibits NASA from making new expenditures for the current IUS. What effect does this provision have on the $35 million Air Force reprogramming request to complete production of IUS vehicles?

ANSWER: The $35 million requested by the Air Force is needed to fully fund two IUS vehicles which are part of a current five vehicle long lead buy. This long lead buy includes two NASA vehicles for the Galileo and Solar Polar missions.

The effect of the urgent supplemental would be to delete these two NASA vehicles thereby reducing the buy to three vehicles and causing a large unit cost increase. We are advised by NASA that under these circumstances they would continue procurement of one of these two NASA vehicles to support their Tracking and Data Relay Satellite requirements. While we would prefer to continue the more economical five vehicle buy, a four vehicle buy is manageable with the $35 million reprogramming request.

NASA & AF AGREE WITH URGENT SUPPLEMENTAL

QUESTION: Do NASA and the Air Force agree with the urgent supplemental requirement that the Solar Maximum repair/retrieval mission be funded on a 50-50 basis?

ANSWER: The Air Force has agreed with NASA to fund 50% of the unique costs associated with the repair/retrieval of the Solar Maximum Mission.

CENTAUR DEVELOPMENT FALTERING

QUESTION: The Senate Commerce Committee has recommended adding $150 million to NASA's fiscal year 1983 request for the Centaur program. Has Centaur development been faltering due to underfunding? Will additional funds be required from the DOD side?

ANSWER: In preparing the FY 83 Budget, the Administration decided to cancel the Shuttle Centaur and continue to use the Inertial Upper Stage (IUS) for NASA and DOD missions. The Centaur development contract has been terminated, and NASA is funding two IUS vehicles on the Air Force production contract to launch the Galileo mission to Jupiter and the International Solar Polar Mission.

The Senate Commerce Committee wants NASA to re-start the Shuttle Centaur program and has directed the reallocation of $150M to do so. (These funds are part of $409 million removed from the NASA Shuttle operations budget with the requirement it be reimbursed by the DOD. This action resulted in joint SECDEF/NASA Administrator letters to the Congress expressing concern about a Congressional Committee without DOD oversight responsibility legislating de-facto changes in the DOD budget).

Both NASA and DOD oppose the sole source development of the Centaur as an unnecessary and therefore wasteful expenditure of between $1 billion and $1.5 billion. NASA would face increased costs for the Galileo flight to Jupiter and the International Solar Polar Mission. DOD requirements through the 1980s can be satisfied by evolutionary improvements to the existing Inertial Upper Stage.

Further, the Centaur cannot evolve into the kind of orbital transfer vehicle the Nation will need in the 1990s and thus would be another "interim" upper stage for the Space Shuttle. However, should the Senate Commerce Committee initiative succeed, we estimate that NASA expenditures $550-600 million, and DOD expenditures totalling between $400 and 900 million, would be incurred to transition the program to the Centaur.

We believe the Nation would be far better served if the Air Force and NASA proceed with a carefully structured Higher Energy Upper Stage (HEUS) program instead of the Centaur. We are structuring the HEUS program so it can grow in an orderly way to meet the Nation's long term orbital transfer vehicle needs. Consequently, only one upper stage development would be needed, and we can completely avoid the $1-1.5 billion investment required to develop an "interim" operationally useable Centaur capability.

SUCCESSFUL CENTAUR DEVELOPMENT

QUESTION: Isn't the Air Force really depending on a successful Centaur development because of foreseeable launch requirements which are likely to exceed the capabilities of today's IUS?

ANSWER: No. The IUS, with minor growth provisions similar to what we have done on previous launch vehicles, can meet all our planned launch needs into the late 1980's. To meet DOD requirements beyond the late 1980's we are proposing a competitively procured Higher Energy Upper Stage.

WAIT FOR HEUS

QUESTION: Would the IOC of a new High Energy Upper Stage alternative to Centaur be consistent with the probable requirement to launch "overweight" systems in the mid-1980's? Could we afford to wait for a HEUS or would Centaur be the only answer?

ANSWER: We can meet all DOD launch requirements until the late 1980s with minor, low risk, low cost evolutionary changes to the IUS (as we have done with all earlier space launch vehicles).

We do not need a Higher Energy Upper Stage until the late 1980s. If we proceed now with the Centaur, both NASA and the DOD will probably need a follow-on in the early 1990s. We can completely eliminate this second development if we begin now to develop a HEUS using P^3I concepts which would allow the HEUS to grow logically to satisfy continuing needs into the next century.

FUNDING EMPHASIS ON CENTAUR

QUESTION: Will the funding emphasis being placed on Centaur for 1986 missions force termination for IUS development programs? Will the accelerated Centaur program necessarily go sole-source?

ANSWER: IUS development is nearly complete; therefore, the urgent supplemental action on Centaur would not result in termination of the IUS development program. Proceeding with the Centaur program would result in increased pressure to terminate the IUS production program after the first follow-on buy.

Premature termination of IUS production could result in insufficient vehicles to meet DOD launch needs before transitioning to Centaur. This is particularly concerning because DOD requirements have not been factored into the proposed Centaur and we face a high degree of risk that the new Centaur would not be developed in sufficient time to meet our launch requirements.

Since Centaur is a General Dynamics program it would be sole source to that company.

RAMIFICATIONS OF EMPHASIZING CENTAUR PROGRAM

QUESTION: What are the ramifications of emphasizing the Centaur program on High Energy Upper Stage development over the next few years?

ANSWER: The Centaur proposed for NASA development would be optimized for the Galileo mission and would not meet near term DOD launch requirements. Major costs would be incurred to modify DOD spacecraft to adapt to the Centaur and to modify the Centaur to meet DOD requirements. These costs are estimated to be $200-500M for the spacecraft and $200-300M for the Centaur. The Centaur has limited growth and restricts on-orbit time for DOD missions.

In order to avoid Centaur becoming yet another interim upper stage which must be followed by another new development to meet NASA and DOD requirements through the 1990s, NASA and the DOD have agreed to a joint Higher Energy Upper Stage program. This program would result in a competitively procured upper stage.

IMPORTANCE OF HIGH ENERGY UPPER STAGE

QUESTION: Why has the Air Force been attaching great importance to the development of a High Energy Upper Stage by late 1987? Do we foresee missions that IUS or Centaur cannot handle?

ANSWER: We project a major increase in spacecraft weight in the late 1980's due to demands for higher reliability, longer on-orbit life and increased survivability. These requirements lead to payload weight growth to provide the required on-orbit expendables (propellants, etc). We also foresee payload weight growth for multimission platforms with secondary payloads The IUS, with minimal improvement, can meet our requirements up to the late 1980's. The Centaur proposed for NASA use requires modifications in order to meet DOD requirements. These include orbital injection accuracy, payload length provisions, payload/ stage interface considerations, load alleviation, and security provisions. Because of these considerations, the Air Force prefers to satisfy our future requirements by competitive procurement of a Higher Energy Upper Stage (HEUS).

By beginning a carefully conceived HEUS program now, we believe we can deliver a new stage to meet our late 1980's requirements. That stage will include Preplanned Product Improvement (P^3I) concepts that will enable the stage to grow to meet both DOD and NASA requirements through the 1990s.

FUTURE IUS MILESTONES

QUESTION: IUS launch availability was delayed by Secretary Orr's August directive from late 1981 to mid-1982. Are future IUS milestones still intact?

ANSWER: Secretary Orr did not direct a delay in the availability of the IUS. His August 1981 letter advised the Congress of the reality that earlier development problems had resulted in a delay of IUS launch availability from late 81 to mid-1982.

The IUS development program has progressed exceedingly well over the past year, including completion of vehicle component and system level qualification tests and successful test firings of the first five qualification motors. IUS software development is also essentially complete.

The IUS for the first Titan III(34)D/IUS flight has been delivered to the Eastern Launch Site (ELS) and is now undergoing checkout for a scheduled September 1982 launch. The IUS for the first Shuttle/IUS flight has completed acceptance testing and the vehicle has been delivered to the ELS for launch processing.

Production delivery activities on the remaining Titan III(34)D/IUS vehicles are proceeding on schedule and support our launch requirements.

In summary, we are confident in the availability of the IUS and expect to meet our program milestones.

COST GROWTH IN IUS PROGRAM

QUESTION: What has been the unit cost growth in the IUS program?

ANSWER: At the time of the DSARC II in Mar 1978, the IUS unit cost was estimated to be $8M (Then Year) for an FY 1979 procured IUS. This optimistic estimate was made before we began full scale development of the IUS. As a result of the technical and schedule problems encountered in the development program and our gaining a better understanding of the technical complexity of the IUS, the unit cost was increased to $22M for the FY 1979 and 1980 vehicles.

The FY 1979 and 1980 vehicles are now on a long lead contract which began in July 1980 for eight vehicles, including five for NASA. In early 1981 NASA cancelled four vehicles from this buy. In January 1982 NASA reinstated one of these vehicles. The revised long lead buy now includes two vehicles for the Air Force, two for NASA, and one for special activities. The unit cost of the remaining five vehicles is now estimated to be $55.4M. Approximately $20M of this growth from $22M is the result of the impact of the NASA termination action and the resultant delay in awarding the full production contract. The remaining growth of $13.4M is the result of new contract requirements and additional hardware cost growth.

Beginning with the FY 1983 buy, we estimate the IUS unit cost will be $44M for a block buy of eight vehicles.

% OF IUS COST GROWTH

QUESTION: What percentage of the IUS cost growth is attributable to the NASA cancellation of four of the eight IUS which were on the long lead contract?

ANSWER: The total IUS unit cost growth for vehicles in the first production buy is $33.4M ($55.4M-22.0M). Of that, 60% ($20M of the 33.4M) is due to the NASA cancellation and the resultant production program delay.

LARGE COST GROWTH IN AF SHUTTLE PROGRAM

QUESTION: The FY 1983 Air Force budget request for the DOD Space Shuttle program is $355.6 million. This support acquisition of the Vandenberg Ground Support system, continued development of the Inertial Upper Stage, continued acquisition of airborne support and payload integration equipment and the Shuttle Payload Integration Facility to prepare for DOD launches from Kennedy Space Center.

Last year, the Air Force estimated the FY 1983 Shuttle budget request would be $256.5 million. Why have we experienced the large cost growth in this program?

ANSWER: The funding levels quoted are for the RDT&E portion of the DOD Shuttle Acquisition Program (PE 64411F). The majority of the increase ($92.9M of the $99.1M increase) is associated with the cost increases from the restructure of the IUS Full Scale Development contract and the increase in the ceiling price from approximately $500M to $700M. The remainder of the increase ($6.2M) is the net result of changes in the Vandenberg acquisition RDT&E funding and RDT&E funding for Controlled Mode activities (security modifications at Johnson Space Center) and DOD payload integration capability development.

SHUTTLE MILESTONES SLIPPED

QUESTION: What Shuttle milestones have slipped from those dates presented in last year's program?

ANSWER: The following milestones have slipped:

STS Initial Operational Capability at Kennedy Space Center (NASA milestone)	Sep 82 to Nov 82
First STS/IUS flight (NASA Tracking and Data Relay Satellite)	Sep 82 to Jan 83
Controlled Mode IOC	Mar 82 to Mar 83
Vandenberg IOC	Aug 84 to Oct 85

JOHNSON SPACE CENTER

QUESTION: We understand the Johnson Space Center Controlled Mode IOC of March 1982 has slipped a year. Why?

ANSWER: Two factors allowed the delay. The first was a delay in the launch date for the first DOD dedicated Shuttle launch. Controlled Mode (secure) capability is required in advance of that mission. That capability is incrementally made available as needed: flight planning (available now), followed by flight training and finally by flight control. The complete capability will be available by Mar 83 to allow time for the correction of any deficiencies and participation in the various flight rehearsals prior to the actual flight.

The second factor was a delay in the NASA schedule for the upgrade of the second and third Mission Control Centers. Control Mode is a modification to the NASA capability. If the basic capability is delayed, the Control Mode modifications must be delayed. The NASA delay was allowed by the general reduction in early flights and the delayed need for the additional Mission Control Centers.

COST INCREASES IN FY 1982 AND 1983

QUESTION: The Air Force Space Test Program budget for FY 1983 is $62.6 million. Part of this program funds projects related to the use of the Space Shuttle as a manned DOD laboratory to support experiments of a classified nature (Teal Ruby).

This program also experienced sizeable cost growth. Can you provide the reasons for the cost increases in FY 1982 and 1983 compared to that projected last year for this period?

ANSWER: The overall funding profile for the Air Force Space Test Program in FY 82 and FY 83 has not changed (other than minor inflation adjustments) from the profiles approved in the last two President's Budgets. That portion of the program related to the use of the Shuttle as a manned DOD laboratory supports sortie type experiments conducted in the Shuttle bay. Teal Ruby is a free-flying spacecraft (will be released from Shuttle and use its own propulsion system to attain the desired orbit) and thus is not associated with the manned DOD laboratory portion of the program.

COST GROWTH PROBLEMS WITH TEAL RUBY

QUESTION: Are the cost growth problems associated with the Teal Ruby program primarily inflation-related, or are they cost-overruns precipitated by an under-estimate of our technical ability to solve these problems?

ANSWER: Teal Ruby is a jointly funded mission. DARPA is funding the development of the Teal Ruby sensor and the Space Test Program is funding the development of the P80-1 spacecraft to fly the DARPA sensor. Addressing only the P80-1 spacecraft portion of the Teal Ruby program, our above inflation cost increases in FY 82 and FY 83 are associated primarily with solving technical problems arising from failures of subsystem components during testing. We have been able to accommodate these increases within the approved Space Test Program budget.

INCREASING DOD-RELATED MISSIONS

QUESTION: Won't we be increasing DOD-related missions in the future?

ANSWER: Yes. The DOD missions on the Shuttle rise from a low of zero in FY 83 to 7.75 in FY 87. The fractional FY 87 number indicates six dedicated (full) Shuttle launches and seven shared launches at approximately one quarter Shuttle each.

TITAN III BACKUP VEHICLES

QUESTION: Space Shuttle development delays resulted in additional actions in FY 1983 to maintain a Titan III production capability. The FY 1983 program for Space Boosters indicates that a request is being made to fund advance buy materials for two Titan III(34)D backup vehicles.

Does committing to an advance buy mean that we are committing to actual production of Titan III backup vehicles?

ANSWER: No. The advance materials allow us to continue Titan production past Sep 83 if the Shuttle develops problems in its early operation period (i.e. the first two operational flights). We are particularly interested in confirming the success of Flight 6 (NASA Tracking And Data Relay Satellite A in Jan 83) which will be the first flight of the Inertial Upper Stage in the Shuttle. If completion of these two TITANS (#17 and #18) is required, this will be an FY 84 issue.

CIRCUMSTANCES TO COMMIT TO PRODUCTION OF TITAN III BACKUP VEHICLES

QUESTION: Under what circumstances would we commit to production?

ANSWER: We would commit to additional Titan vehicles if the Shuttle develops significant problems during or before flight 6

(Jan 83). If the problem is severe enough, such a commitment may also include a development program to improve the Titan performance to allow launch of Shuttle unique payloads.

TITAN III PRODUCTION PHASE-DOWN SCHEDULED TO BEGIN

QUESTION: When is the Titan III production phase-down scheduled to begin? Are you confident that the Shuttle will be able to handle all DOD-related activities planned for it by that time, or will we have to keep the Titan line open?

ANSWER: Titan III production phase out begins Sep 83 unless the option for additional vehicles is exercised. The capability for producing additional Titan boosters will be incrementally lost -- beginning with those skills and tasks which are completed earliest on the vehicles already in production. We have requested FY 83 funds for advance materials for two additional Titans. This would allow production capability to continue past Sep 83.

We would exercise the option for two further vehicles only if we experienced significant problems with the Shuttle through Jan 83 (i.e. in the first six flights). If the Shuttle is successful in meeting its performance targets and if we can avoid long term outages of the Shuttle capability, the Shuttle will handle all DOD-related activities through the early 90's.

We will retain three Titan backup vehicles (already in production) through 1985-86 to cover contingencies during that period. Additional Titan backup vehicles (beyond the existing three) would require significant development for increased performance to be universally capable as backups. Such a development effort is not warranted at this time. Our backup strategy has provided the necessary operational flexibility during the critical years leading to the operational introduction of the Space Shuttle.

EXPENDABLE LAUNCH VEHICLE

QUESTION: Does the FY 1984 POM contain funds for development of a new expendable launch vehicle?

ANSWER: No. There are no funds for development of a new expendable launch vehicle in the FY 84 POM. However, the Advanced Military Spaceflight Capability program will continue concept development work that ultimately may lead to definition of a new class of launch vehicles for DOD unique contingency operations.

BREAKOUT OF 83 FUNDS FOR SPACE LAUNCH SUPPORT

QUESTION: The Air Force Space Launch Support budget request for FY 1983 is $16.4 million. Part of this is for the payment of the Orbital Flight Charge for a space test program sortie mission to NASA; it also provides first year funds for procurement of an Inertial Upper Stage for a Space Test Program mission.

How is the funding for these two efforts broken out in the FY 1983 budget?

ANSWER: The $16.4 million RDT&E requested in the Space Launch Support program provides first year funds of $14.7 million for an IUS and $1.7 million for payload integration and man/payload interface development activities. There are no funds in the RDT&E request for payment of an Orbiter Flight Charge.

IUS QUANTITIES CHANGED IN AF PROCUREMENT PLANS

QUESTION: IUS quantities have been changed in Air Force procurement plans from one fully funded vehicle to advance buy of four vehicles to be procured as part of an eight vehicle block buy. Why was this change made?

ANSWER: There were two factors involved in the change of Air Force procurement plans for the IUS. First, the Air Force requirement for IUSs increased due to a change in the DOD Mission Model. Second, beginning in FY 1983, the IUS requirements for the Air Force, NASA, and the DOD users were consolidated into a block buy of eight vehicles. Consolidation of requirements into a block buy stabilizes the production plan and results in an estimated cost savings of over 20%.

We plan to buy future IUS requirements with this revised approach of an eight vehicle block buy every two years.

REASON FOR FUNDING INCREASE

QUESTION: The FY 1984 funding estimate provided for Space Launch Support is $40.3 million, more than double the FY 1983 request. What is the reason for this funding increase?

ANSWER: The projected increase in RDT&E funding for Space Launch Support from FY 1983 to FY 1984 is due to increased requirements for flight charge reimbursements to NASA and integration costs for Space Test Program sortie missions, increased funding for the second year of a three year, incrementally funded IUS, and a continuing buildup in the development activities for the Manned Spaceflight Engineer program which has the objective to identify, develop, and exploit the beneficial uses of man for payload operations in the Shuttle era.

TECHNICAL PROBLEMS AT VANDENBERG

QUESTION: Last August the Committee received notice from the Air Force that the IOC of the Vandenberg AFB shuttle launch site had slipped from August 1984 to October 1985. At that time Secretary Orr noted that Vandenberg had major problems, such as:

- a shortage of contractor engineering manpower
- engineering changes
- increased concurrency between Vandenberg and Kennedy
- erecting the Shuttle orbiter in the wind of the launch pad

Do you still consider these technical problems? If so, how serious are they?

ANSWER: We believe we have solved two of the problems: the engineer shortage and the Space Shuttle Vehicle assembly problem. The former was solved with the engineer hiring program instituted by the contractor which brought the hiring rate back to the necessary levels and the latter with the Shuttle Assembly Facility (included in the FY 83 MCP). The remaining two (engineering changes and concurrency) are continuing challenges for our management. They can be and are controlled and managed,but they cannot be eliminated.

BACKUP FOR ADDITIONAL EXPENDABLE LAUNCH VEHICLES

QUESTION: Will Vandenberg be used as a backup for additional expendable launch vehicles?

ANSWER: Yes, the first DOD Shuttle missions from Vandenberg will have a backup Titan launch vehicle available.

LAUNCH PAD COST INCREASE

QUESTION: Why has the launch pad cost increased, necessitating a $17.4 million reprogramming request? How far is the second launch pad contract behind schedule?

ANSWER: The $17.4M reprogramming was caused by a problem in phasing funds for the launch pad. We had recognized the requirement for increased funding of the launch pad -- in FY 83 where we projected a requirement for $22.2M. We were unable to delay the funding requirement to FY 83. We, therefore, requested Congressional approval of a reprogramming action using the SRB Retrieval and Disassembly Facility as the source for the necessary FY 82 funds. The deferred SRB Facility was funded from the FY 83 launch pad (reduced by those requirements now funded in FY 82) and the Kennedy Space Center Security Modifications (reduced based upon results of the latest security study). The requested changes in FY 82 and FY 83 are listed below:

FY 82	Old Amount	New Amount	Change
Launch Pad	5.0	22.4	+ 17.4
SRB Disassembly	18.0	.6	- 17.4
		NET CHANGE	0
FY 83			
Launch Pad	26.5	14.8	- 11.7
Security Mods-KSC	15.7	9.1	- 6.6
SRB Disassembly	0	18.3	+ 18.3
		NET CHANGE	0

The launch pad is the critical path item for Vandenberg. The initial operational capability delay from Aug 84 to Oct 85 (14 months) was driven by our problems in completing the launch pad contract work. The launch pad contract is on schedule for the Oct 85 IOC.

INCREASE IN FUNDING FOR CSOC

QUESTION: The CSOC budget for FY 1983 is $32.1 million. This is $9 million above the budget projection for FY 1983 made last year. How come the satellite control IOC and the Shuttle control IOC have slipped while the funding for CSOC has gone up?

ANSWER: The increase in the FY 83 RDT&E request over last year's estimate is consistent with the restructure of the CSOC development and construction program. It reflects the increased emphasis on front end design work and systems integration planning as well as a slower than anticipated start in FY 81. Specific areas the increased efforts will address include interoperability between the CSOC, the Satellite Test Center and Johnson Space Center; automated scheduling of satellite and Shuttle control network resources; and additional activity included in the recently awarded integration support contract.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DOD SHUTTLE SUPPORT

Question: Is it NASA's position that the Centaur upper stage, with appropriate adaptions, could handle all projected DOD launch requirements?

Answer: NASA cannot certify the ability of Centaur to meet all projected DOD requirements. We have been informed that several hundred million dollars will be necessary in order for DOD to use Centaur in addition to the DOD impact of about $100 million caused by the Congress's directed cancellation of the inertial upper stage. A future improved high energy upper stage will still be needed by DOD and NASA.

Question: Can current and projected NASA launch capabilities (including upper stage vehicles) meet known DOD requirements?

Answer: No. We have been advised by the DOD that a new high energy upper stage (HEUS) must be approved as a joint NASA/DOD program with a flight readiness date in the late 1980's if future DOD requirements are to be met.

Question: How does development of a new high energy upper stage (HEUS) fit into NASA's plans for the future?

Answer: A version of a high energy upper stage (HEUS) will be necessary to satisfy the transportation needs for which NASA is responsible in the 1988-2000 time frame. In that period, we forecast the need for a lower cost-per-pound to orbit compared to current and programmed upper stages. We anticipate individual payloads as heavy as 10,000 to 15,000 pounds to geostationary orbit (GEO) starting in the late 1980's; by the mid-to-late 1990's manned trips to GEO will pose a challenge equivalent to carrying some 35,000 pounds one-way to GEO.

The HEUS could be planned to meet these needs. Although it would be "expendable" at first, it would be initially designed so that it could later be readily modified for return to the Shuttle and thereby realize the economy associated with reuse. Later, it could be enlarged for space basing and eventual manned missions.

A joint USAF/NASA study was planned to define the nature and evolutionary milestones of a stage to meet both the USAF and NASA needs; however, the Congressionally-directed Centaur program will probably delay this study.

SENATE COMMERCE COMMITTEE ACTION

Question: Under the Senate-approved version of the NASA authorization, as we have discussed, Defense would be assessed an additional $409 million of the Shuttle program costs in FY 1983. First, are you aware of how that figure was derived? Were the underlying assumptions fair?

Answer: We have not been provided the specific assumptions and methodology utilized to develop the $409 million additive DOD reimbursement estimate. Our best understanding of the estimate's derivation is that specific elements of the average cost per flight in FY 1983 were used to calculate an approximation of the "materials and services" cost for two Department of Defense launches in FY 1984; the resultant number was adjusted by the planned DOD reimbursement to NASA provided for in the DOD FY 1983 budget request. NASA's estimate based on the projected FY 1984 costs for the specific materials and services cost categories (agreed to with DOD for reimbursement purposes) for these same two flights adjusted by the currently negotiated reimbursements from the DOD would result in an estimate of $120-$130 million. Recognizing the recent reduction from two to one and one-half flights in FY 1984 would reduce this estimate to $90-$100 million.

This approach of pricing actual costs on a year-by-year basis is, however, totally inconsistent with long standing agreements between NASA and DOD regarding allocation of Shuttle development responsibilities and their related costs as well as pricing policies that were carefully formulated. These agreements were approved by previous Administrations and previous Congresses and have provided a reasonable approach to both management and funding for the STS. We are in the process of negotiating updated prices for the FY 1986 - FY 1988 time frame that increase the DOD prices based on current cost projections and are consistent with the NASA/DOD pricing policies.

Question: What systems do you have in place in NASA and DOD for determining full costs of the Defense missions on the Shuttle?

Answer: NASA has adopted a budget and accounting structure which captures the cost of standard Shuttle services to all users. Standard services to DOD missions are basically the standard services provided to all users. Unique services provided to DOD missions are booked separately as optional services.

OUT-YEAR PROJECTIONS

Question: What are the long term funding implications of the NASA/DOD cost sharing changes proposed by the Senate approved NASA authorization and contained in the Urgent Supplemental? Please provide out-year projections for the record.

Answer: The Senate number of $409 million is apparently derived by taking internal NASA calculations of the annual average cost per flight for FY 1983 flights, excluding certain cost elements from the total, and multiplying the escalated value of the remaining elements by the planned number of DOD flights in FY 1984. The resultant number, which we understand was $462 million, was then reduced by the amount of reimbursement charge ($12.2 million per flight in FY 1975 dollars--which was negotiated by DOD and NASA in 1977) understood to be already incorporated in the DOD budget request to derive the $409 million number.

Since we disagree with the methodology of the calculation, which differs in the content of "materials and services" launch cost used by NASA and the DOD and the use of an FY 1983 figure for launches planned for FY 1984, we are reluctant to provide projections based on the Senate's approach. However, using the same elements of cost used by the Senate Committee staff, but correcting the calculation for the year of launch, we have derived the following estimates:

FY 1983:	$ 200 million	(1.5 flights)
FY 1984:	635 million	(3.75 flights)
FY 1985:	1150 million	(4.75 flights)
FY 1986:	1910 million	(7.0 flights)

These estimates include a provision for inflation at 8.5 percent annually. The parenthetical number of flights is for dedicated Shuttle flights scheduled for the following fiscal year. That is, the reimbursement is planned for FY 1983 in payment for FY 1984 flights.

URGENT SUPPLEMENTAL

Question: Do NASA and the Air Force agree with the Urgent Supplemental requirement that the Solar Maximum Repair/Retrieval mission be funded on a 50-50 basis?

Answer: Neither NASA nor the Air Force agree with the intent of Urgent Supplemental that the Solar Maximum repair mission funding be shared on a 50-50 basis. From the NASA point of view, the mission is a dedicated NASA Shuttle flight with the Solar Maximum repair as a companion to the deployment of the Long Duration Exposure Facility (LDEF), another NASA payload.

It is highly desirable also to impress upon the civil user community that payload servicing and retrieval has widespread applications that include payloads other than defense missions.

The Air Force already accepts the application of servicing and retrieval in their payload planning.

Last, NASA has identified for the Congress the methods to be used to fully fund the mission. The infusion of Air Force funds into the project may complicate the management and possibly dilute the image of the mission as an open civil operation. In spite of this, the Air Force has agreed to provide the Congressionally-directed funds which would total $6.6 million over three fiscal years.

QUESTIONS SUBMITTED BY SENATOR PROXMIRE

DEPARTMENT OF DEFENSE

QUESTION: Dr. Cooper, both you and Dr. Mark in your prepared testimony indicate that DoD has budgeted $10.9 billion for shuttle-related activities through fiscal year 1987. Frankly I am more interested in what DoD has budgeted for the Shuttle through fiscal year 1983. We all know how slippery out-year estimating can be.

The space agency will spend a total of $17.2 billion on Shuttle design, development, test and evaluation as well as production through the next fiscal year, exclusive of in-house personnel and facility construction costs. How much has DoD budgeted for shuttle-related activities through fiscal year 1983?

ANSWER: The DoD has budgeted $4.3 billion for shuttle-related activities through fiscal year 1983.

DOD SHUTTLE PLANS

Question: Dr. Mark, I asked Dr. Cooper how DOD's Shuttle cost through FY 1982 compared with the $17.2 billion you will be obligating for Shuttle activities through the end of next fiscal year. Let me put the shoe on the other foot and ask you how Shuttle development, production, and operations cost through FY 1987 will compare with the $10.9 billion DOD plans to budget for the Shuttle related programs through 1987?

Answer: The NASA funded Space Shuttle development, production, and operations cost, on a basis generally comparable with our understanding of DOD estimated investment of 10.9 billion, would total $29.6 billion through FY 1987. This resulting ratio of DOD to NASA costs is roughly consistent with the projected STS usage of 113 DOD flights out of 311 total. The NASA costs (based on the FY 1983 President's budget) include:

STS Development	$10.1 billion
STS Production	7.2
Changes and Upgrading	.5
Performance Augmentation	.3
Operations Capability Development	.3
Shuttle Operations (Direct)	7.6
DTMS/ETB	2.3
Upper Stages	.6
Facilities	.7
TOTAL	$29.6 billion

Question: In your prepared testimony, you indicated that DOD is projecting 113 flights out of a total of 311 Shuttle flights through FY 1994. On the other hand, a GAO report, dated April 26 states: "Based on NASA's latest traffic model, DOD is estimated to require 114 of the estimated 234 Shuttle flights through 1994, or about 49 percent of the flights." What accounts for the difference in the estimates?

Answer: The GAO report citing 234 flights through FY 1994 assumes no increase in Shuttle launch rate is made beyond that provided for in the President's FY 1983 budget. Current planning for future increases in Shuttle launch rate capability is addressing the potential timing and needs of additional facilities and support that might eventually be necessary to achieve higher flight rates. Since some traffic models project requirements for up to 40 Shuttle flights per year, NASA's assumptions are based on a model which totals 311 flights through 1994.

QUESTION: The April 26th GAO report I referred to earlier stated that of a total of $3.5 billion budgeted by NASA for shuttle costs in 1983, $1.1 billion -- about 31 percent -- could properly be attributed to the need to support DoD missions. What's your reaction to that estimate and why shouldn't DoD pay these costs?

ANSWER: The GAO's approach is deficient in many respects. For example, costs were allocated for FY 83 based on projected DoD use over a twelve year period (through 1994) under the assumption that the STS capacity would be limited to no more that 24 flights per year. Current plans are to increase the flight rate to 40 flights per year, thus changing significantly the DoD percentage utilization. Further changes are likely. The approach of allocating near-term costs based on highly uncertain long-term projections is indeed questionable. As NASA points out, acquisition of the orbiter fleet and KSC launch and mission control capabilities are a NASA responsibility. These costs accrue even if DoD were not a user. The same is true for KSC operations. Therefore, by GAO definition, these cost are not allowable.

VANDENBERG SHUTTLE FACILITIES

QUESTION: When NASA appeared before the Appropriations Committee there was some question about the amount of money DOD was spending on the Vandenberg shuttle facilities. Can you give us your best estimate of the total DOD cost of those shuttle facilities? Shuttle costs through 1983?

ANSWER: The Vandenberg launch and landing capability is estimated to cost $2.5B to acquire, of which $1.6B will have been obligated through FY 83. In addition, we will have obligated about $53M through FY 83 to operate and maintain Vandenberg facilities brought on-line during that period.

SUBCOMMITTEE RECESS

Senator SCHMITT. Gentlemen, I appreciate your tolerance and time. I must go over and chair the floor. The hearing is recessed until Wednesday, June 23, when we will have a closed hearing on space-based lasers. That ought to be interesting.

Dr. COOPER. Thank you.

[Whereupon, at 1 p.m., Wednesday, June 16, the subcommittee was recessed, to reconvene Wednesday, June 23, 1982.]

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1983

WEDNESDAY, JUNE 23, 1982

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:15 a.m. in room 1318, Everett McKinley Dirksen Senate Office Building, Hon. Ted Stevens (chairman) presiding.

Present: Senators Stevens, Garn, Schmitt, and Andrews.

DEPARTMENT OF DEFENSE

STATEMENTS OF:

ROBERT S. COOPER, PH. D,

DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY (DARPA)

DOUGLAS H. TANIMOTO, PH. D., DIRECTOR, DIRECTED ENERGY OFFICE, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

ACCOMPANIED BY MAJ. GEN. DONALD LAMBERSON, USAF, ASSISTANT FOR DIRECTED ENERGY WEAPONS, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

SPACE-BASED LASER PROGRAM

OPENING STATEMENT OF SENATOR STEVENS

Senator STEVENS. This is the time scheduled to inquire into the status of the space-based laser technology. This is a top secret, restricted level of classification and only those individuals with proper clearances can attend.

We have scheduled this hearing to provide the subcommittee with the fullest possible information on the technical status of our space-based laser program. We wish to confine the scope of our hearing to primarily technical matters.

What we seek today is a clearer understanding as to what our current technological capabilities are, and the kinds of tasks needed to be undertaken to integrate these technical elements into a space-based laser demonstration. While program and policy issues are relevant, what we are primarily interested in is the state-of-the-art technology and how space-based lasers might be useful as weapons in the future.

We will also need to examine the adequacy of the current budget estimates.

I am sure the witnesses are aware that the entire issue of space-based laser technology is currently undergoing intense review in the Congress. The House Armed Services Committee has rejected funding for the Alpha and LODE projects and instead propose an additional authorization of $50 million for research and development of short wavelength lasers. We want to discuss that issue so that we have a clearer understanding of the progress of the two technologies and their funding needs prior to our markup.

Now, there are witnesses here to day from the Defense Advanced Research Projects Agency (DARPA). We would like to have an opening statement from you, Dr. Cooper, and then proceed to the technology briefing by Dr. Tanimoto and Dr. Pike.

Gentlemen, any statements that you have will be printed in the record. We would appreciate it if you would highlight your statements. I had requested Senator Wallop to join us this morning. He is most interested in the subject.

SUBSTANTIAL GROWTH IN LASER PROGRAM

Senator SCHMITT. Mr. Chairman, it is no surprise that they will hear me say this. I do think that at this point in our laser technology development the program we are going to hear about is a reasonable one; it is one that is compatible with what the program ought to be at this time. I think we all feel that the program has to grow substantially as we move into the remainder of this decade.

As a matter of fact, I personally, believe that we have to make sure that there is a very broad-based technology program that will drive the competitive components in the subsystem technology eventually using Shuttle and airborne systems at the test subsystems level.

The airborne test program is underway at this time with chemical. The Shuttle program is not yet in such a state.

The funds for this broad-based research and technology program should be provided this year and should be expanded in the future.

My own very rough estimate is that a 10-year R&D program of this kind is probably about a $5 billion program in order to develop a base of technology necessary to look at what we might do in terms of prototype weapon systems in these two environments—space and air.

The technology program should include, as it does now, and expand in the future, parallel system studies to examine and continuously update the operation of software for both air- and space-borne systems. Sometime in the [deleted] timeframe I suspect we are going to be ready to move out to rapidly develop and demonstrate an actual airborne weapon system based on technology, and then at the same time be moving out on an offshoot of the technology program to look at the space-based weapon prototype that I think can well be tested in the [deleted] timeframe.

This is not as aggressive a program as others have proposed, but I think it is a prudent program to look at and avoid the very high probability of misjudging which technology we should pursue and as a consequence end up with nothing except having spent a lot of money.

Mr. Chairman, I do think that at least for the fiscal 1983 budget the Air Force and DOD have proposed a good, solid program. I do not think this program will be adequate, however, as we move into 1984 and subsequent years, and this committee and the Congress as a whole are going to be faced with making decisions at a significantly higher budget level than we currently have.

Thank you, Mr. Chairman.

Senator STEVENS. Any other statements?

Dr. Cooper?

TECHNICAL ADVANCEMENT IN LASERS

Dr. COOPER. Thank you very much, Mr. Chairman.

I think the remarks by Senator Schmitt were quite appropriate and not inconsistent with the current view held by Defense.

I think we have made a great deal of progress, which we would like to tell you about here this morning, in the technical area over the last 3 years, both in the space-based laser weapon area, which we will focus our attention on mainly in this discussion, but also in the other broad areas that we are working on in high energy laser research and development.

Focusing specifically on the space-based laser weapon program, over the past year we have, in response to the Congress, put together an entirely new program plan for the 5-year defense program period. We have submitted that plan. Secretary Weinberger transmitted that plan just a few days ago to Senator Tower and we are moving on that plan, which is a comprehensive plan, to conquer the major issues that we have to conquer in this space-based laser weapon program area.

In addition, we have an entirely new senior management structure which has been set up in Defense to manage this very fast-paced and very high-level program.

Overall, the request for fiscal year 1983 is $433 million. It is the largest technology program that Defense is pursuing at this stage of the game. Consequently, we feel we needed this close management at the Office of the Secretary of Defense level to insure that the pace of this program is maintained adequately and the funds that we have requested are expended in a responsible way.

We have what we believe to be rational milestones associated with the space-based part of that plan which projects by [deleted] that the substantial early work will have been completed on the weapon system concept, the early design on the three major program elements in the space-based laser weapon technology program, and that we will be in a position to determine whether increased funding in the fiscal year [deleted] and outyears budget, which will have to be decided upon in the fiscal year [deleted] time period in order to be included in the defense plan, is a reasonable approach to take.

So, it is that early milestone that we are looking to and the support of the technology work and system work that will be done in the near term to make the decision as to whether we should step up the expenditures in the planning and programing activities toward the end of the decade that Senator Schmitt was referring to.

Now, we believe we have a very fast-paced program which over the past year, because of our intensive planning effort, we believe is fully funded in the 5-year defense plan to reach those near-term goals and the goals of the demonstration of the technology in [deleted].

This plan, I think, is complete and we don't believe that there will be substantial deviation from that plan over the next 3 or 4 years that will be required either in our technical goals or in the scale size of the funding. There may be some slight variation in the funding which we will be discussing with you perhaps in the next few years, but we don't see any sizable increase or decrease in the plan in the near future.

What I would like to do now is to turn to the head of the Directed Energy Office, Dr. Tanimoto, and ask him to run through the technical accomplishments in the program, what our near-term plan is, and try to summarize all of that in about 15 minutes.

[The prepared statement of Dr. Cooper follows:]

PREPARED STATEMENT OF ROBERT S. COOPER, PH.D.
DIRECTOR

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Mr. Chairman, I would like to thank you for the opportunity to appear today before your subcommittee, to testify on the DOD Space-Based Laser Program. With me are my colleagues, Major General Donald Lamberson, Dr. Douglas Tanimoto and Dr. Alan Pike.

INTRODUCTION

The space laser program has generated a considerable amount of controversy over the past several months. That controversy results from the fact that on the one hand, the technology suggests that spaced-based lasers have the potential to provide very significant military capabilities including (deleted), defense against strategic aircraft and ballistic missile defense. On the other hand, significant uncertainties exist with regard to that potential. These include technical feasibility of the projected weapon performance levels, ultimate weapon effectiveness, and growth capability of the technology to react to responsive threats. Resolution of these uncertainties is important since the weapon development program is projected to be expensive.

Recognizing that it is essential to have a well focused program with timely milestones, the Department of Defense, with the support of the Congress, has prepared a comprehensive, DoD-wide plan for the resolution of the uncertainties associated with space laser weapons. The objective of the plan is to provide the basis for an informed decision on whether to proceed with the validation phase of a development program for space-based laser weapon systems.

This plan is the result of much hard work by many people at all levels of the Army, Air Force, and the Defense Advanced Research Projects Agency. It has been approved by the Services and me, and has been forwarded to the Secretary of Defense for approval and transmittal to the Congress. Let me outline its contents for you.

OBJECTIVES AND THRUST OF THE SBL PLAN

The primary goal of the DoD Space Laser Plan is to focus development efforts so that by the end of (d) they will provide the basis for an informed decision on whether or not to initiate weapon development. The program is structured to provide an intermediate milestone in (d). At that time, a program review will determine if progress warrants provision for funding for the weapon development phase beyond the (d) decision point. One potential outcome of a favorable decision in (d), would be an "on-orbit" demonstration in (d).

(U) The investment strategy used in the plan is to make a prudent investment that selectively addresses only the highest priority issues that create the decision-inhibiting uncertainties. This strategy has the following key points:

- Early emphasis on uncertainties whose resolution can provide insight into the ultimate military utility of space lasers and guide the technology efforts--principally target vulnerability and laser survivability
- Concept definition to the level of detail needed to identify potential show stoppers, focus technology development, and bound cost estimates
- Dependence on the DARPA Space Laser TRIAD to establish a convincing argument that the fundamental technology for space laser weapons can be achieved
- Inclusion of technology efforts that address critical issues in achieving perceived first-generation weapons, and demonstrate feasibility or proof of principle for solutions to these issues
- Finally, providing for technology base efforts to define growth potential to meet the perceived needs for increased performance in later generations of space lasers

While ballistic missile defense of the United States against ICBM and SLBM attack is the ultimate focus of the program, two other major applications will be addressed: 1) **(deleted)** , both anti-satellite and satellite defense; and 2) Defense against strategic aircraft, both U.S. air defense and fleet defense. Of these potential missions ballistic missile defense is clearly the most difficult to achieve.

UNCERTAINTY RESOLUTION

As Mr. Carlucci noted in his letter which was forwarded to you together with the 1981 Report to Congress on Space Laser Weapons, there are areas of major uncertainties in our ability to predict with confidence the ultimate utility of such weapons. In consonance with this, the activities we will pursue in the program are grouped into seven major areas of uncertainty:

Target Vulnerability and Hardening. How vulnerable are missiles, aircraft, and other targets to laser radiation? Can they be hardened against it? At what cost?

Utility. Are space-based laser weapons cost-effective compared with other ways to perform the mission? What cost can we enforce on an enemy's response to deployment of a system?

Survivability. Can the laser force survive physical attacks and complete its mission? Can it maintain mission effectiveness in the presence of active and passive countermeasures?

System Definition. What are the individual elements of a space laser force deployment to perform the missions of interest? How should functions be allocated among them? How do we integrate and control them? Deploy and maintain them? What development is needed to achieve the required performance? Concept of operation? What should be the goals and objectives of the validation phase? How achieved? Cost?

Basic Technology Demonstration (Triad). Can we demonstrate the technical feasibility of basic beam control; optics; acquisition, tracking and pointing; and chemical laser device power? Are these demonstrations sufficient to insure scalability to first generation weapon requirements?

Weapon Feasibility Technology. Can technology be developed that supplements the basic laser technology programs and improves our confidence in being able to meet performance requirements? Is technology needed to meet support performance requirements, such as launch vehicle capability? Is the technology available to support the validation phase?

Growth Technology. Can shorter wavelength laser technologies be developed for the more demanding missions?

During the early years of the program, major emphasis is placed on two areas: The first is vulnerability and hardening, because the amount of laser energy required to destroy a target drives many of the required system performance parameters. We must also understand the extent to which it is economically possible to harden missile boosters and aircraft to laser radiation. The second area is total system architecture and integration. All elements of a weapon system beyond the laser platform, such as surveillance, command, control and communication links, launch support and ground support, must be identified in order to focus the technology development, address the integration issues, and develop reliable system cost projections. In the latter stages of the program the emphasis is on the technical feasibility of achieving the required performance levels.

PROGRAM MANAGEMENT

(U) In the development of this program plan, we have sought to establish a balance between the technology and the system constraints. A successful program cannot succeed without both of these elements being mastered. DARPA will be primarily responsible for the technology, while the Services will concentrate on the system aspects. The program will receive strong central management from the Office of the Under Secretary of Defense for Research and Engineering. We will carefully guide and review all aspects of the program and be sensitive to both breakthroughs and problems which may change our assessment. As the program matures we expect to transition progressively the current DARPA efforts to the appropriate Service.

(U) We are also in the process of creating a "red team" to provide independent and objective evaluation. This is particularly needed in the areas of target hardness and vulnerability, laser platform survivability and weapon utility because cf the great sensitivity to these areas which I have already discussed.

SOVIET LASER PROGRAM

(U) The nature and pace of the Soviet space-based laser program has been cited as a reason to accelerate our activities and is therefore material to the issue. We do not necessarily develop a given weapon because the Soviets do. Nonetheless, should the Soviets place a laser weapon in space, the world could perceive it to be a great achievement, much as it did Sputnik. I believe that whatever the Soviet's develop we could match it if there were reason to do so.

(Deleted.)

CONCLUDING REMARKS

(U) In conclusion I would like to express my confidence that the program is well balanced and focused to demonstrate feasibility of performance levels, define system integration issues and identify the utility of space laser weapons. I request your support for this important defense program.

STATEMENT OF DOUGLAS H. TANIMOTO

Senator STEVENS. Dr. Tanimoto.

Dr. TANIMOTO. Thank you, Mr. Chairman. I appreciate this opportunity to come here and to give you a rundown on the technology status of the program.

I do have a statement for the record which I would like to submit.

VUGRAPH 1

(Classified Chart Deleted)

Dr. TANIMOTO. I would like to go through what we see as the major potential of the program. As you are aware, DARPA is in the business of pursuing the high-risk technologies that could have significant impact on future defense requirements. We see space-based lasers as having the potential of addressing on a global scale a broad range of applications.

In particular, the near-term technologies we are pursuing at DARPA might provide for the capability to get to the [deleted] class weapon-grade device that might provide for antiaircraft-type application. With a [deleted] weapon, on the order of [deleted] of these would have the ability to destroy perhaps [deleted] aircraft in the continental U.S. defense, or in a fleet defense role of a U.S. carrier task force.

In a space superiority arena, we feel that these satellites of the order of [deleted], or in fact a lesser capability, would be capable of taking on satellites, the [deleted], a much more capable system, could be capable of taking on these satellites in a shorter time-frame.

Senator SCHMITT. Doctor, would you explain a bit more to the subcommittee the [deleted].

Dr. TANIMOTO. What I am describing here is the chemical laser technology. When I say [deleted].

Senator **Schmitt**. That is [deleted], where?

Dr. **Tanimoto**. [Deleted]. Pardon the jargon, but this is a way of describing the goodness of the systems in delivering intensity at target.

What we are talking about are targets at ranges of the order of [deleted] of kilometers. With a more capable system of the order of [deleted] one does not need as large a constellation to achieve the same kinds of mission.

Ultimately, we see a large number of [deleted] being capable of taking on ICBM-[deleted]-defense missions. This is an attractive potential of the technology. At this time we are only pursuing the major elements that would allow us to have the confidence that such a weapon system could be developed.

Vugraph 2

(Classified Chart Deleted)

In particular, the DARPA program really pursues three major technologies—large optics—and in this case we are demonstrating a [deleted] that would be possible to be made [deleted] much larger dimensions. It has the ability for [deleted].

In this case, since we are talking about space applications, that is not as serious an issue, but we feel that [deleted] technology will be demonstrated in this time frame.

Another major element of the program is a demonstration of a chemical laser device at a [deleted]. We have confidence as a result of some very significant recent experiments that indicate that it may be possible to take this technology and scale up to [deleted] downstream. This is a chemical laser ground demonstration in the [deleted] time frame.

The third major element of the program is a space experiment demonstration of pointing and tracking in the [deleted] time frame. This would allow us to engage targets at [deleted] kilometer ranges and [deleted] in Earth and space backgrounds. Ultimately, this would lead to considering the option of going to an on-orbit technology demonstration.

I would like to briefly describe these three elements:

Vugraph 3

(Classified Chart Deleted)

TALON GOLD PROGRAM

The Talon Gold program started in the 1979 time frame. With the preliminary brassboard and design competition, we concluded that the major objectives to achieve on the order of [deleted] stability in pointing to a target was possible. That was demonstrated in brassboard experiments.

We have to take that now, in an integrated, detailed design, to a ground test in the [deleted] time frame. Notice that the designs we will review, all of the major design efforts are completed by the [deleted] time frame. That is why we take [deleted] as a major milestone to make a decision whether to proceed ahead with an on-orbit weapon demonstration.

Senator SCHMITT. Is that date driven by technology or by funds?

Dr. TANIMOTO. I think at this point in time the effort is such that the schedule is pretty tight. I think sometime back we might have been able to achieve the critical design at an earlier date. I think at this time we are pretty much on a fast-paced program to get a critical design in the [deleted] time frame.

Senator SCHMITT. Are the funds adequate to solve problems?

Dr. TANIMOTO. We feel the major uncertainties will be addressed at that time.

PROGRAM MILESTONES

Senator SCHMITT. One of the problems the Space Shuttle ran into was that they didn't have enough money to solve problems without slipping their milestones. As a consequence, they never were going to catch those milestones.

Is this program funded to solve problems without slipping milestones?

Dr. TANIMOTO. We did not want to slip the major milestones of the program. What we had to do was reexamine such items as the [deleted]. It constitutes some regret in the program, but it still allows us to achieve the major objective of the program, which is to demonstrate that you can point a laser at a target at ranges on the order of [deleted] kilometers and to get that [deleted], and also in Earth and space-type backgrounds.

Senator SCHMITT. I want to pursue this, but I still have not had my question answered.

Dr. COOPER. Perhaps I can answer it from a broader perspective of DARPA overall. The Directed Energy Office constitutes 25 percent of the total DARPA budget. Within that Directed Energy total there is some flexibility for us to move funds around to meet contingencies in any one of the programs. It is our feeling at this time that we have adequate flexibility to cover potential problems that could result between now and fiscal year [deleted] in the Talon Gold program.

Senator SCHMITT. I hope you will keep the subcommittee informed if you see any possibility that the milestones are going to have to slip in order to solve technical problems in the near term. We have gotten into trouble before by inadequate funding and inadequate reserves, and then having to slip the milestones. I don't think we can afford to let that happen in this new technology where the Soviets are also moving.

Dr. COOPER. I understand that, sir. We have over the past year replanned this program and have provided significant increases in the funding to cover potential contingencies. We do have a contingency fund in the program now.

Senator SCHMITT. What percent?

Dr. COOPER. I believe the contingency is on the order of 10 percent. We have additional flexibility that would probably add at least another 10 percent if needed. It is our best judgment that we have provided good management and a fallback reserve funding in this program.

You will find this is also true in the other two major elements of the program. That is really what I was referring to in my opening remarks when I said the program now is fully funded. We have added a significant increment of funding to assure that we can meet the goal with the funds available.

Dr. TANIMOTO. Not to belabor the point, but under Dr. Cooper's leadership we have examined the program in depth to provide the contingency risk reserve for the uncertainties that might come into a high risk program such as this.

Senator SCHMITT. There is a great tendency for the administration and Congress to look at that reserve as a place to cut, and in so doing you lose the program. I just want to emphasize that point.

Dr. COOPER. I understand that. That is why I am a little bit reluctant to reveal exactly how the funds are available to us; but I can assure you that we have adequate flexibility there and we will use it, if necessary.

VUGRAPH 4

(Classified Chart Deleted)

ALPHA CHEMICAL LASER EFFORT

Dr. TANIMOTO. The second element of the program is the Alpha chemical laser effort. This is a demonstration at the [deleted] with high quality beam near diffraction limited output. What we are showing here is rather high efficiency in the performance of this device typically at a [deleted] than what would normally come out of an atmospheric-type laser. A chemical laser that exhausts in the atmosphere would be a [deleted] efficient.

We are looking at lightweight-type components for this subsystem. Again, we show the detailed design effort prior to the test which will take place in the [deleted] timeframe.

Senator SCHMITT. That is on-orbit test?

Dr. TANIMOTO. No, sir; the laser will be ground tested.

Only one element of the triad will be space tested; that is the pointing and tracking system that I described earlier Talon Gold.

VUGRAPH 5

(Classified Chart Deleted)

LARGE OPTICS DEMONSTRATION

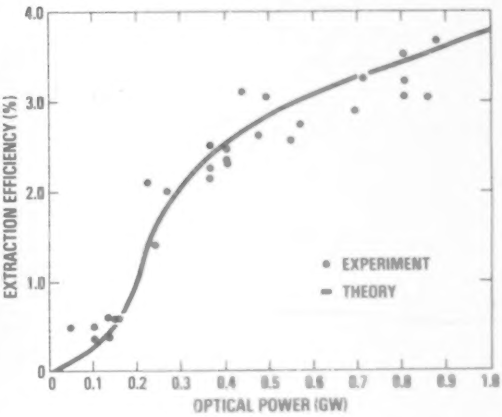
The third element is the large optics demonstration. We will demonstrate a [deleted] mirror and provide wave front sensor control to show we can handle a large structure and the large disturbance that might be associated with a laser device. This, again, will be ground demonstration with the CDR to take place in the late [deleted] timeframe.

FREE ELECTRON LASERS

TAPERED MAGNETIC WIGGLER

LOS ALAMOS WIGGLER*

HIGH EFFICIENCY AMPLIFIER THEORY VERIFIED



$$\text{WAVELENGTH} = \frac{\text{MAGNET PERIOD}}{(\text{BEAM ENERGY})^2}$$

VUGRAPH 6

SHORT WAVELENGTH LASER ACTIVITIES

Now, what I would like to do is jump into another area of the technology base program within the space-based lasers. With the next few charts I would like to describe the status of some of the short-wave length laser activities at DARPA.

We have free electron, excimer, and [deleted]. All of these provide for shorter wavelengths and shorter wavelengths are desirable because of the fact that shorter wavelength allows us to scale down to smaller optical apertures to achieve the same levels of intensities at a given range.

Free electron lasers are basically a marriage of quantum optics with electron accelerator technology. An electron beam is made to pass through a periodic magnetic field . . . That is, a structure that has periodic permanent magnets. This structure causes the electrons to oscillate and thereby emit optical output. The laser wavelength is determined by the periodicity of the magnetic field and is inversely proportional to the square of the beam energy.

We have developed a theory that is consistent with the experimental data. We feel that with this preliminary result, in theory, it may be possible to scale up to much higher energy and higher efficiency.

I should caution you, this is very preliminary information. We are proceeding with three different free electron laser concepts.

WAVELENGTH SPREAD

Senator **Schmitt**. What is the spread of wavelength you might generate?

Dr. **Tanimoto**. As I show here, you can vary the periodicity of the magnet to get change in wavelength, so you have some kind of spectral bandwidth that you can deal with, but you have a discrete tunability. Changing the periodicity or the energy of the electron beam, you may go from microwave up into the infrared. It is a wide range, but you would have to discretely change some of the conditions.

Senator **Schmitt**. Is there a weight penalty for the lower wavelengths?

Dr. **Tanimoto**. You mean the shorter wavelength?

Senator **Schmitt**. Yes.

Dr. **Tanimoto**. In this case that is not——

Senator **Schmitt**. It is mainly electronics?

Dr. **Tanimoto**. It is really the conversion efficiency of, say, your prime power supply to the accelerator that drives this.

Dr. **Cooper**. There are really two issues here. One is the ability to make very small magnetic field structures which will be required to take the shorter wavelength.

The other is to produce very high beam energy. The structural one does not have any weight penalty. The beam energy does have some weight penalty.

Senator **Stevens**. We will be back in a few minutes.

[Brief recess.]

FREE ELECTRON LASERS

Senator **Stevens**. Why don't you continue, Doctor. I have some questions later about the terms used in the statement.

Dr. **Tanimoto**. I would like to wrap up this chart.

One of the key points I would like to make here is that much of the work that we are doing in the free electron laser program is directed toward much shorter wave lengths, but the work that has been accomplished to date has been at [deleted]. Free electron lasers would be very attractive if we could realize the potential of very short wave length and very high efficiency. The work today is still at [deleted]. One must understand this when we speak about the viability of short wave lengths using free electron lasers.

The other point has to do with the fact that the laser power derives from the kinetic energy of the electron beam being converted into optical energy. The electron beam is in a very fine pencil of the order of a couple of millimeters in diameter. In order to extract that kind of high energy out and convert that into optical energy, one would have to come up with [deleted].

There are several very advanced technology elements that must be developed before we can realize the high energy that the systems might provide in the future.

Typically, new laser developments have taken on the order of 10 to 15 years to realize their potential into the high average power class. Free electron lasers were only recently demonstrated. The first free electron laser operated in the 1977–78 timeframe. The concepts that we are pursuing presently project to very high efficiency and short wave lengths.

We feel there is quite a bit of work that has to be done before we can realize the implementation that would allow us to get to high average powers with high efficiency. We are presently quite a bit away from the efficiencies required for a weapon.

EFFICIENCY OF LASERS

Senator STEVENS. What would be the relative efficiency of your other lasers?

Dr. TANIMOTO. The most mature laser technology for these applications is the chemical laser. We feel on the order of [deleted] percent of the chemical reaction energy that is released can be converted into optical energy. One can estimate the number of kills that one can provide in a platform by the amount of fuel that one carries on a platform. On the order of [deleted] pounds, of fuel will be required for a kill.

LASER FUEL SUPPLY

Senator STEVENS. What would be the fuel supply for this type of laser?

Dr. TANIMOTO. For the short wavelength type of laser the power would come from electrical input. One would have to generate a prime power source. A prime power source might be an MHD generator; or it may be a space [deleted] power supply, if we were to use this in space. On the ground you can use some other kind of electrical power.

Senator STEVENS. We are thinking of use in space.

Dr. TANIMOTO. Yes, in space we would have to develop a power supply if we want to consider systems that will operate on the order of [deleted] of run time.

Dr. COOPER. In anticipation of that, we are starting in DARPA, in relationship with NASA and the Department of Energy, this year a [deleted] program which would mature at about the same time the technology would [deleted]. So, we have corresponding programs that support this technology if it finally does pay off.

LASER BUDGETING

Senator SCHMITT. Is that budgeted now in those three budgets?

Dr. COOPER. Yes, it is. It is not included in the budgetary material that you have related to space-based laser programs because it has other applications, high-powered radar and high-powered communications systems as well. We have budgeted that not in relationship with this program but it clearly does have potential application in the space-based program.

Senator SCHMITT. Who has the lead in that?

Dr. COOPER. We are in the final throes of signing a memorandum of agreement with NASA and with the Department of Energy on that. That issue is the one issue that remains to be resolved.

Senator SCHMITT. What can we do to help get it resolved? We spend more time deciding who is going to do what to whom.

Dr. **Cooper**. In a few days we will be resolving that issue. It is not standing in the way of the program. The elements of the program are coming together and that issue will be resolved in a timely way.

Dr. **Tanimoto**. I would like to make one other point:

To realize the wave length advantage in the free electron laser, we would have to have beam quality and wave front quality that would be a factor of [deleted]. We feel the optics technology program we will pursue in the chemical laser is in the direct path of the development of free electron laser optics in the future. We have to develop that kind of capability.

The Chemical laser is at a wave length which is a [deleted].

Vugraph 7

(Classified Chart Deleted)

EXCIMER TECHNOLOGY DEVELOPMENT

In addition to free electron lasers, we are pursuing excimer technology for short wavelengths. The excimer laser however, does not scale to the kind of efficiencies that we project for free electron lasers ultimately. The excimer laser can only be utilized in a construct that will have the laser on the ground, with large mirrors in space. With the laser on the ground we can talk about pretty high average energy output; however, significant correction for the propagation path through the atmosphere would have to be made. That is a very serious technology issue that is being addressed today.

We feel this technology would apply, however, also to blue-green laser communications with submarines. That is another spinoff of this technology.

Our plan is to proceed with the technology experiments and have pulsed power output in the [deleted] timeframe and scale up to much higher levels downsteam. However, I should remind you again, this is not a space-based construct.

Senator **Schmitt**. What are the weather limitations on the use of this laser?

Dr. **Tanimoto**. Weather would be very significant on the way up, so it is very important that the transmitter station be on a mountaintop or someplace where you have a clear line of sight to the relay mirror.

Dr. **Cooper**. Also, you would have a proliferate the ground stations to have a high probability of line of sight. You might have to have several ground stations in the system.

Dr. **Tanimoto**. You would want something on the order of [deleted] stations scattered far enough apart to get a [deleted] percent probability of having a clear line of sight without intervening atmosphere.

Dr. **Cooper**. Clearly, a major issue in developing a system out of this technology.

VUGRAPH 8

(Classifed Chart Deleted)

LASER DRIVE

Dr. **TANIMOTO**. Now I would like to move to another very attractive construct and that is the use of [deleted] lasers, the notion of driving a laser by [deleted]. That is to say, you [deleted] regime. It may be possible, based on some experiments that were conducted back in [deleted] in the projects indicated, with the proper efficiencies and beam divergence, it may be possible to get on the order of a [deleted]. That is to say, when a [deleted]. By channeling or directing this energy into a material that would [deleted].

Senator **SCHMITT**. Focus range?

Dr. **TANIMOTO**. Yes, not necessarily focus, but at least more directionality. We are not talking about the kind of divergences you would get with a normal laser. In order to get that kind of very tight divergence one must consider the use of optical resonators. It is not realistic to talk about designing resonators [deleted].

One of the problems associated with using orbiting platforms with chemical lasers is the large number of platforms required to have coverage over the missile silo field. If you have a [deleted]. Under a very heavy saturation [deleted] is a complementary system which would allow you to handle a large number of targets simultaneously. With [deleted] one could pump on the order of [deleted], each one alined to a separate target. I think that is made more clear by the next chart.

VUGRAPH 9

(Classified Chart Deleted)

This is a configuration in which the [deleted]. You could have as many as [deleted] each one individually alined to a separate target, so that, if you were confronted with a threat cloud of [deleted].

However, this device would [deleted]. We would have to concern ourselves with a [deleted] problem. That is an issue that will have to be looked at. Also, the business of individually alining these [deleted] and sorting out of targets, has to be addressed. We are presently going through an application and technology driver study to determine what has to be done to really fully exploit this technology.

Senator **SCHMITT**. It is very scenario oriented?

Dr. **TANIMOTO**. It is; that is correct. [Deleted.] For low launch rates you would have to go to orbiting platforms. This is a complementary system that you can launch to engage the [deleted].

Senator **SCHMITT**. Think about it very carefully.

Dr. **TANIMOTO**. Don't be misled by the beautiful artist's conception of this device. It is in the very early stages of understanding. We are still trying to understand the physics of this kind of laser.

Dr. **TANIMOTO**. There are perhaps [deleted] experiments that have to be conducted before we can really get a handle on optimization of the pump source, the right lasering medium and so forth.

VUGRAPH 10

(Classified Chart Deleted)

I should also point out here that we are addressing a broad spectrum of possible applications. What I am describing here is [deleted]. We feel as I mentioned earlier, [deleted].

We feel that the program we are pursuing really works across the board. The main emphasis is presently directed toward the programs that we feel are most mature.

Senator **SCHMITT**. Are you testing the side effects of the [deleted] in space?

Dr. **COOPER**. You mean the [deleted] in space?

Senator **SCHMITT**. And communications.

Dr. **COOPER**. Yes, we have a vigorous program in cooperation with DNA to understand the nuclear weapons effects on satellites and possible weapon systems in space. At least in part, there is a substantial effort in our current plan to resolve those issues, that is, the survivability issue [deleted] in the current plan. We will understand that, we believe, by the [deleted] time period.

U.S. COMMUNICATIONS RECONNAISSANCE SYSTEMS

Senator **SCHMITT**. I am also thinking of the impact on our own communications reconnaissance systems with that device in space.

Dr. **COOPER**. One of the major thrusts that we have in Defense now is the increase in survivability of our space systems generally. We are taking a broad look at that in relationship to the MILSTAR satellite development program. We are also looking at measures that we can take to increase the hardness of the NAVSTAR APS satellites and we are taking a broad look at the measures we have taken in the past in the DSCS III satellite system and FLTSATCOM to understand the levels of hardness that are required.

We will factor those into our understanding of this [deleted] laser weapon potential.

Senator **SCHMITT**. Hardness and maneuverability and detectability?

Dr. **COOPER**. All those are factors in survivability.

Senator **SCHMITT**. All of those sound to me like it will require upper-stage maneuverability.

Dr. **COOPER**. Maneuver potential is going to be a valuable asset in the future.

Senator **SCHMITT**. With laser communications you solve some of the problems of using these kinds of devices in space, do you not?

Dr. **COOPER**. Possibly.

Dr. **TANIMOTO**. As Dr. Cooper mentioned earlier, the 5-year DOD program will address the survivability/hardening issue, in which we will look at the nuclear environment as well as directed energy environment for the platform.

HF/DF – SHORT WAVELENGTH LASERS
WHY PURSUE BOTH TECHNOLOGIES?

- IN THE NEAR TERM, HF/DF SPACE LASERS COULD HAVE SIGNIFICANT MILITARY POTENTIAL
  - DEFEND FREEDOM TO USE SPACE
  - ATTACK AIRCRAFT WORLDWIDE
  - BALLISTIC MISSILE DEFENSE
- SHORT WAVELENGTH LASERS COMPLEMENT HF/DF LASERS
  - IN THE FARTHER TERM, THEY COULD PROVIDE A CAPABILITY AGAINST EXTREMELY HARD TARGETS
    - IF TEN TIMES BETTER LASER BEAM CONTROL THAN HF/DF CAN BE ACHIEVED
  - THEY ALSO HAVE APPLICATIONS IN LASER COMMUNICATIONS WITH SUBMARINES AND GROUND BASED LASER ASAT

VUGRAPH 11

CHEMICAL U.S. SHORT WAVELENGTH LASER TECHNOLOGY

Now, the issue of chemical lasers, HF/DF versus short wavelength laser, why pursue both technologies? As I mentioned earlier, the systems could be complementary, the ultimate weapon construct.

In addition, it is very important to understand that the technologies being developed for chemical lasers are necessary before you can really fully realize the short wavelength technology.

In addition, as I mentioned before, the maturity of the short wavelength technology is [deleted] technology. There is quite a bit to be done before we can start to talk about getting the efficiencies; even taking free electron lasers from [deleted], that is quite an undertaking. Most of these shortwave technologies that we are pursuing today are rather in the infant stage, so we feel that the chemical laser technology, which is already about 10 or 15 years old, is much more mature and is a necessary step in the process of going to more robust systems.

We feel some of the short wavelength nearer term application of excimer or free electron lasers will be in communications with submarines. That is a spinoff possibility of the program. As I mentioned before, the beam quality requirements to fully utilize the short wavelength are 10 times more demanding than for chemical lasers that operate in the infrared.

There is a lot to be done before we can really fully utilize and employ short wavelength lasers.

Senator SCHMITT. Could I ask if the [deleted] of the ballistic missile is significantly different than the antiballistic missile?

Dr. COOPER. In relationship to using one of these devices as a defensive weapon?

Senator SCHMITT. Yes.

Dr. COOPER. No. The engagement time is the only issue that will be shorter.

Senator SCHMITT. There is still an opportunity for engagement?

Dr. COOPER. Yes, with the exception, perhaps, of [deleted], because there is a question of [deleted] into the atmosphere. [Deleted.] The mid-infrared chemical laser beams can reach down into the atmosphere to those altitudes.

Senator SCHMITT. Is that significant enough that you ought to carry it as a budget item you are exploring? The [deleted] missile is a greater threat to the system than are the others. The one thing the laser offers you is the opportunity to increase the time that you have for command and control, a more rapid antiballistic missile response.

Senator STEVENS. Doctor, could you finish. I have a series of questions about funding.

Dr. TANIMOTO. It is a very important point, that the [deleted], whereas the other lasers would.

Senator SCHMITT. I would appreciate any other thoughts you can provide for the record. I hope you will consider that issue.

[The information follows:]

TARGETS FOR SPACE LASER WEAPONS

Potential targets for space laser weapons systems include satellites, strategic aircraft, ballistic missile boosters and re-entry vehicles. [Deleted] which must be used at altitudes above 100 kilometers because of atmospheric absorption, are therefore not effective against aircraft and short range, depressed trajectory ballistic missile boosters (such as the [deleted]. All satellites and long range ballistic missile boosters or post boost vehicles, however, are vulnerable to potential [deleted] laser weapon systems which are either deployed in space or are forward based and popped up upon enemy launch. [Deleted] laser systems may also be effective against extremely hard re-entry vehicles at altitudes above 100 kilometers in exo-atmospheric terminal defense. Deuterium Fluoride chemical lasers and conventional short wavelength lasers (such as excimer and free electron lasers) penetrate the atmosphere with minimal attenuation and therefore can be effective against endo-atmospheric targets.

VUGRAPH 12

(Classified Chart Deleted)

BEAM CONTROL INDEX AND LASER POWER

Dr. TANIMOTO. Laid out here in a two-dimensional plot is a measure of quality which we display as a beam control index and laser power. I will now indicate where we are with our present component technology, then, where we intend to go with the triad level, space laser triad technology, and, what we see as the requirements for a first-generation laser weapon.

You see here the kind of missions that one might be able to accomplish for various levels of technology: [Deleted].

Senator STEVENS. You don't have dates on the other two?

Dr. TANIMOTO. This is the present space laser triad level of effort. The DARPA program only provides for technology opportunities up through the demonstration of the triad. Beyond that, a decision would have to be made, a preliminary decision, in the [deleted] timeframe, with a firm decision to go ahead in the [deleted] timeframe. That is why I did not put it on this chart.

Senator STEVENS. Thank you very much, Doctor.

[The prepared statement of Dr. Tanimoto follows:]

PREPARED STATEMENT OF DR. DOUGLAS TANIMOTO

Director, Directed Energy Office

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Mr. Chairman, I am Dr. Douglas Tanimoto, Director of the Directed Energy Office of DARPA. I am pleased to have the opportunity to describe to this subcommittee DARPA contributions to the DOD Space Laser Program. DARPA has, in fact, budgeted for the major resources devoted to demonstrating the technical feasibility of the technologies that are most critical to achieving a space laser weapon capable of performing important defense missions.

As Dr. Cooper has pointed out, we are selectively addressing only the highest priority issues that are the source of uncertainties that we believe inhibit our ability to make a decision to initiate formal development of space laser weapons. Establishing technical feasibility of the three major technologies addressed by the TRIAD is fundamental to our capability to proceed with confidence into a weapon development program. The second major element of our laser program, those efforts in short wavelength lasers, are designed to complement and exploit the nearer term TRIAD technology efforts. First, let me describe the status of the TRIAD.

The Triad is a well established program that began in 1979. It is the most mature laser technology element of the Space Laser Program. It is the largest development step in demonstrating the technical feasibility of space laser weapons and as such paces the decision to proceed to a weapon development program. Approximately $500 million are currently allocated to Triad programs over the life of the program. The three elements of the Triad will provide demonstrations of:

The generation of [deleted] with a space compatible laser device concept (ALPHA)

The fabrication and precision control [deleted] which focuses the laser beam on the target (LODE)

Precision pointing that holds the laser beam on the target [deleted] consistent with weapon operations (Talon Gold)

Further insight into the program status and the uncertainties to be resolved by Triad can be gained by examining the program milestones vis-a-vis the major decision milestones of the DOD program. By the end of fiscal year [deleted] when there is a major program review, we are scheduled to have completed the detailed design of the elements of Triad. In addition, brassboard demonstrations of critical component technology will be available to support the program review. By the scheduled decision in fiscal year [deleted] on whether or not to proceed into weapon development, the major demonstrations of the Triad are scheduled for completion. Specifically, plans call for (1) ground demonstration of the ALPHA chemical laser device which has a performance goal of [deleted] (2) ground demonstration of a [deleted] and critical beam control components (LODE); (3) in-space demonstration of acquisition, tracking, and pointing system (Talon Gold) consistent with holding a focused beam on an aimpoint with an accuracy of [deleted] These demonstrations are structured to provide the basic technical feasibility of technology that can be scaled to what we now see as the performance requirements of a first-generation weapon. Therefore, these demonstrations provide the technology base for an option to move to [deleted] demonstration in fiscal year [deleted].

Turning now to our short wavelength laser efforts, our current program is addressing technologies for a broad spectrum of military applications ranging from submarine laser communications to ground-based laser antisatellite to ballistic missile defense. We plan to invest $29.5 million in fiscal year 1983 on these efforts. The program has four major thrusts: (1) free-electron lasers, (2) excimer lasers, (3) advanced laser beam control, and (4) [deleted]. In addition, the short wavelength laser area remains a fertile ground for new ideas with breakthrough potential. Now I will be more specific about these four thrusts.

The free-electron laser (FEL) concept is based on extracting laser energy from the interaction of an electron beam with a magnetic field. Since the output wavelength is a function of the energy of the electrons in the beam, the laser is tunable over a range of wavelengths. Conceptually, this laser concept offers promise of [deleted] of power at high electrical efficiencies. To date, we have demonstrated efficiencies on the order of [deleted] and have identified concepts to increase this efficiency [deleted]. During the next [deleted] experiments will be conducted to demonstrate operation at short wavelengths (visible and ultraviolet), to improve accelerator design, to develop optics capable of handling the ultra-high flux loadings on the mirrors, and evaluate conceptually the integration of FEL technologies in both ground and space applications. Successful completion of the technology program will lead to a decision [deleted]. Sufficient flexibility exists within the DARPA budget to make a major commitment to such a device at that time. In fiscal year 1983, DARPA will invest approximately $14 million in free-electron laser technology.

Our Excimer Laser Program continues the good progress of the last few years. Subscale experiments indicate that Xenon Fluoride (XeF) lasers can [deleted]. During the past year, we have demonstrated laser outputs that are predicted to be [deleted]. We plan to initiate design of [deleted] and make a decision [deleted]. In parallel with these efforts we are developing converters to shift the ultraviolet output of the XeF laser to wavelengths suitable for submarine laser communications. [deleted] will be designed with a converter. Thus, the device if constructed and coupled with appropriate beam control elements can provide a residual operational capability for both ground-based laser antisatellite and communication with our strategic submarine force.

In order to realize the full potential of scaling to shorter wavelengths, very high performance, high power laser beams control is required. For space deployment of short wavelength lasers, the Talon Gold and LODE programs are developing generic beam control technology which is broadly applicable to a range of space applications. For space-based laser applications at short wavelengths, a pointing and tracking system [deleted] will be required. To meet these stringent requirements, programs will be initiated during [deleted] to demonstrate inertial reference units [deleted]. Most of the beam control technology development by the LODE Program is directly scalable to shorter wavelength applications with little or no modification. However, refinements in some component technologies will be needed and would be tested in a subscale brassboard at the conclusion of the current LODE Program.

The short wavelength laser program at DARPA is also supporting research in [deleted]. This capability may provide the basis for a ballistic missile defense. In fiscal year 1983, DARPA is investing approximately $2 million in this technology.

During the year's review of our budget request, the House Armed Services Committee has raised the issue of why we should pursue both the HF/DF chemical laser technology of the Triad and short wavelength technology. I want to spend a minute addressing that issue.

HF/DF technology is approximately [deleted] ahead of short wavelength technology. Substantial risk remains in developing the efficient, high power lasers and beam control elements required by even the earliest applications of short wavelength technology. Many of these technology areas are at a very early stage of development and require new and innovative approaches to achieve the improved performance promised by scaling to shorter wavelengths.

We regard the two technologies as complementary. [Deleted] HF/DF space lasers have significant military potential in such missions as protecting our freedom to use space, worldwide air defense, and limited defense of the US against ballistic missile attack. Short wavelength laser technology complements these HF/DF efforts in two primary ways. First, [deleted] short wavelength technology could provide a capability against targets that have been made extremely hard to the performance levels achievable with HF/DF technology, that is of course, [deleted]. Second, short wavelength lasers also have nearer term applications in laser communications with submarines and [deleted] systems.

The final point I would like to cover is where we stand vis-a-vis the performance levels needed for the various applications. We have component technology today that has demonstrated performance levels consistent with those needed [deleted]. But there is a significant difference [deleted]. Using this measure, the Navy laser program will, [deleted]. This combination of power and beam control components that focus and hold the beam steady on the target [deleted]. We currently envision a first-generation weapon level capability to be achievable [deleted].

This concludes my presentation which I would like to summarize in the following way. Space lasers have a broad range of military applications in antisatellite, antiaircraft, and possibly in antiballistic missile roles. Several different weapon constructs with complementary capabilities appear feasible. With these points in mind, we believe we have constructed a well balanced and focused program to demonstrate feasibility of performance levels in the various constraints.

INCREASE IN DARPA SPACE-BASED PROGRAM

Senator STEVENS. I have a series of questions. I am going to go through some of them and submit the balance of them.

Can you tell me, has the DARPA space-based program been increasing or decreasing as a percentage of your overall program?

Dr. COOPER. I believe over the past few years the space-based laser weapon program in DARPA has been a steadily increasing fraction of the DARPA budget. Typically, when you move to an engineering phase on technology programs, as we are in the three major Triad programs, the expenditures grow by substantial amounts, and we are now under contract to proceed to the critical design review phase in each one of the three major elements of the program, and the expansion of the expenditures there is substantial.

We will be investing in those three programs alone around $500 to $600 million over the [deleted] year period to complete those three programs, and that does represent a major expansion in our expenditures in space-based weaponry in the DARPA budget.

Senator STEVENS. Where is your contracting concentrated—in institutions? In universities?

Dr. COOPER. The large aerospace contracts, for instance, the Talon Gold contract is held by the Lockheed Co. The Alpha contract is held by TRW. The LODE contract is in final negotiation with Lockheed.

Senator STEVENS. With regard to the significant uncertainties that you say exist with regard to military capability of space-based lasers, as I understand it, your current program looks to a fiscal year [deleted] decision whether to initiate weapons development; is that correct?

Dr. COOPER. That is right. At that time we could either decide not to do anything more with respect to demonstration, or we could decide to do a weapon feasibility demonstration in space with an integrated system, or we could decide we are in a position to move directly to a weapon prototype test in space.

Senator STEVENS. What is the relationship of the [deleted] date that you mentioned as far as space-based laser development? You indicate there is an intermediate milestone in [deleted]. What is the significance of that?

Dr. COOPER. As a practical matter, in order to start a major new program that will either be a demonstration in space, feasibility demonstration in space of a prototype weapon system, one would have to budget for that in advance.

The critical budget year is typically [deleted] years in advance of the time, so our decision in [deleted] would be whether to set up a separate line in the defense budget and to fund that line in the outyears, that is, to hold funds available in the outyears, to start that program and to begin to do the preliminary work required to get a start to the [deleted] time period.

Senator **Stevens**. Can you resolve any of those uncertainties that you mentioned before [deleted]?

Dr. **Cooper**. We intend to have all of those resolved by [deleted] and we intend——

Senator **Stevens**. That is not the question. Can you do it sooner?

Dr. **Cooper**. I don't believe so, sir. I think our program now is paced at as rapid a pace as we can make it run to resolve those critical issues. That really is the basis for the disagreements that exist generally in the programing, the question of whether we could resolve those issues sooner or whether we are there today. Those issues are not issues of whether we can proceed to weapon system development today.

Our view is that that is not the case, we cannot do that, and that we can't really resolve the issue sooner than [deleted] because it depends on the testing associated with the three major elements of the DARPA program.

Senator **Stevens**. We are going to face a decision on the [deleted] budget that will determine whether or not you can proceed——

Dr. **Cooper**. In [deleted], right.

WEAPONS DEVELOPMENT PROGRAM STARTUP

Senator **Stevens**. But you can really start up a weapons development program in [deleted] based upon the concept that you make a decision in [deleted]; is that right?

Dr. **Cooper**. Precisely. What we are doing in [deleted] is preserving the option to start in [deleted] by funding—by planning and programing funds in the outyears at that stage. Now, if we were not to do that, that is, if we were not to do the proper programing and planning, starting in [deleted], then we would not have the option open to us in [deleted] without major reprograming efforts. So, our intermediate milestone in [deleted] is a programing budget and milestone based on critical design reviews and a brassboard demonstration and the technology program and substantial issue in the system area which will be dealt with in the other parts of the program, primarily in the Air Force part of the program.

Senator **Stevens**. Excimer really is not a space-based program, is it?

Dr. **Cooper**. That is correct.

Senator **Stevens**. How much money is dedicated to that in this period?

Senator **Schmitt**. If the chairman will yield, the laser is not space based but the components to make it useful in that capacity have to be space based.

Dr. **Cooper**. It could have space-based application, but the laser would not be space based.

Dr. **Tanimoto**. It would engage the threat in space or on the ground, but there are orbiting mirrors in space. The laser would be on the ground.

Senator **Stevens**. How much money is going into that one?

Dr. **Tanimoto**. I don't have the exact number but I can provide it for the record.

[The information follows:]

Our fiscal year 1983 request includes approximately $14 million for [deleted] development and related [deleted] technology.

PROGRAM FUNDING

Senator **Stevens**. You say you have $14 million in free electron and [deleted]. I wondered what your balance is in terms of the funding of these programs.

Dr. **Cooper**. Perhaps I could characterize better the funding that we have invested in short wavelength laser development overall. In the fiscal year 1983 budget it is roughly $30 million overall.

Senator **Stevens**. If that is the case, that has to be $14.2 million also.

Dr. **Tanimoto**. That is not entirely correct. The short wavelength beam control program is part of that—part of the $30 million. Now, we feel that the free electron laser would be available for a ground-based configuration before it would be available for space basing.

Senator **Stevens**. The House committee wants to add $50 million to the short wavelength laser concept. Did you request that?

Dr. **Cooper**. No, sir, we did not.

PROGRAM REDUCTIONS BY HOUSE

I would like to clarify an issue which is not well understood, I believe. The House Armed Services Committee in its action took three reduction actions in the whole high-energy laser program, two of which affected the space-based laser part of the program directly. For instance, they zeroed the LODE program—the large optics development program. They also zeroed the Alpha chemical laser part of the program. They reduced the high-energy technology line by $44.7 million. Now, in that high-energy laser technology development line was included the $30 million for short wavelength laser development, so they took out all of the funds that we were investing in short wavelength lasers in that $44.7 million reduction, and then they put back $50 million for short wavelength laser technology development. So, in effect, they only added the difference between $44.7 million and $50 million for additional short wavelength laser work.

Senator **Schmitt**. The difference between $30 and $50 million?

Dr. **Cooper**. I am sorry; the difference between $30 and $50 million, so they added roughly $20 million for short wavelength laser work.

Senator **Stevens**. They deleted substantially all the money?

Dr. **Cooper**. Yes. All of the short wavelength technology money, which was in that line, which amounted to roughly $30 million.

Senator **Stevens**. They eliminated Alpha and Lode?

Dr. **Cooper**. They eliminated both Alpha and Lode.

Senator **Stevens**. Aviation Week indicates that was your recommendation.

Dr. **Cooper**. That is not so. The President's program is the program we presented to you. It includes all of the funding in DARPA for all three of the triad elements, for all of the short wavelength technology development, and for all of the support to the space-based laser program. It also includes in the Air Force budget a substantial part of the system and mission development and vulnerability work that we had planned in the program.

Senator Stevens. Aviation Week says you encouraged the House Armed Services Committee to endorse this program and to reorient away from the long wavelength chemical lasers toward short wavelength lasers, which is what House committee recommends.

Dr. Cooper. That is incorrect, sir. I read that article in Aviation Week and I sent a letter to the editor of Aviation Week clarifying my position on that. My position is that the President's program is the program that we should support, that it has adequate funding both for the near-term effort, the effort based on chemical laser, and we have adequate funding for the development of short wavelength lasers in the program.

Now, the question that was asked in that hearing was the question of balance, should we invest more in short wavelength lasers? Is the short wavelength laser potential great? My answer to that is yes, the short wavelength potential is great but we don't need more funding in that area because our funding is adequate.

What is more, we have flexibility to reprogram funds when new ideas come along which look promising. I believe that is the correct position.

STUDY REPORT LEAK FROM DARPA

Senator Stevens. Aviation Week seems to pay a lot of attention to your program. It says that DARPA has conducted a study of survivability of laser battle stations against Soviet nuclear detonations in space. Did a report of that study leak from DARPA or where did it come from?

Dr. Cooper. I don't know where that information came from.

Senator Stevens. How good is our security in that area now?

Dr. Cooper. There has been a great deal of public discussion of space-based laser weaponry. It seems to have captured many people's imagination, consequently there are many people around in the land trying to gather information about the program. We have security guidelines which we have provided to all of the people who have access to classified information in the program, and these guidelines are very specific about what information is releasable and what information is not releasable.

MISSILE DEFENSE PROJECT

Senator Stevens. I have had some of the people talk to me about trying to initiate some type of Manhattan-type project, particularly oriented toward missile defense. Is this technology in a position where it would benefit from such concentration of effort?

Dr. Cooper. No sir, we believe it is not. We believe that we will not be able to launch a major program to establish a weapon system in space based on this technology until after our current program is complete in the [deleted] time period.

Senator Stevens. Do you have any preference now in DARPA concerning the potential of any one of these systems? Are you going to concentrate on any one as opposed to the other?

Dr. Cooper. Sir, we believe the current laser, [deleted] are mature enough so that we can at least conceive of weapon capabilities resulting from the technology developments in this area. Now, whether or not we will decide after the [deleted] demonstration that we should actually pursue such a weapon system will be a decision that we will make based on the best information we have at the time. We think now, currently, the only technology that could support a weapon concept in space is the [deleted] technology.

I don't believe anybody should be under the impression that that technology is a flashlight in space or is a very limited capability because from our current projections, if our technology demonstrations are successful, you could create a very credible and [deleted] weapon in space based on this technology.

PRIORITY OF MISSILE DEFENSE SYSTEM

Senator **Stevens**. Are we going to run into the problem that people are going to accuse us of development of a weapon before we develop a defense system?

It seems to me that the missile defense system at our current imbalance with the Soviets ought to have a pretty high priority; yet it does not seem to have it.

Dr. **Cooper**. Well, sir, it is a potential growth option in the MX basing schemes which are being looked at today. Having an underlay of antimissile weaponry could enhance the survivability of the MX close basing mode. We are pursuing the technology that will be useful to provide a growth capability of ABM as an underlay in that system.

Senator **Stevens**. A Defense Science Board task force on space-based lasers that you were on, and Dr. Teller, in 1981, concluded, "There is no immediate promise of achieving significant [deleted] system based on current technology." The report maintains, "A variety of [deleted] may have great difficulty coping is another problem."

Is that still DARPA's position?

Dr. **Cooper**. Yes, it is, and the substantial uncertainties that are associated with those statements are ones that are going to be directly addressed in the current program over the next few years.

In the fiscal year 1983 budget, for instance, there is a program in the Air Force budget for $48.6 million to address issues of the sort that were uncovered by the Defense Science Board, so that if there are any Achilles' heels in this technology we should know what they are by [deleted], if the Congress approves the funding of that part of the program, and we are able to address the survivability and countermeasures issue.

From a management standpoint, sir, we have set up a concept of a red team and a blue team. The blue team will be the technologists who are working as advocates for this type of technology to be useful in a space-based laser weapon system; and the red team will be a challenging team, a team that will look at the survivability of that system and a potential way to attack it, to look at ways to harden the targets that the systems might be designed against and act as a foil for the blue team advocates.

We think that this technique of providing substantial funding, substantial technical talent, to try and find the Achilles heel in the concept that has been put forward today, should provide us with all that we need to know to understand whether we should go ahead with such a weapon system development, or whether it has a fatal flaw associated with it in one of these areas of uncertainty.

Senator **Stevens**. It seems that you are concentrating totally on the weapon technology as opposed to defensive systems technology. I think that is going to lead us into some significant political problems downstream if that is the case.

Dr. **Cooper**. Perhaps General Lamberson could address that issue, because we do have a substantial investment in the next few years in the program dealing with those issues of the vulnerability of the system.

EMPHASIS ON WEAPON DEVELOPMENT

Senator **Stevens**. I am not talking about the vulnerability of the system, but about the development of a system to protect us against incoming missiles, as opposed to the defensive weapon capability that is involved in this system. It looks like the emphasis is on the development of the weapon and not the development of a system to stop incoming weapons.

Am I being too simplistic?

Dr. **Cooper**. I think everybody views the end result potential as being an antiballistic missile system component. That is the hardest of the possible missions, and one of the missions that was outlined by Dr. Tanimoto.

Senator **Stevens**. It seems we are getting far-term treatment right now. I am just analyzing this from the point of view of the problems we will get on the floor one of these days if that is the perception. Is that an improper perception, and if so, why?

Dr. **Cooper**. It is a complete misapprehension of our program objectives. Our objectives are to look at all three of the basic missions—antisatellite mission, antiaircraft mission and antiballistic mission—and to find out what system concept makes sense for all three of these areas, and what the difficulties are in actually accomplishing those missions with the technology that we think we can provide by [deleted]; and the funding in the Air Force program and activities associated with that program are the key to understanding the potential that these weapons may have in the three mission areas.

ANTIBALLISTIC MISSILE CAPABILITY

Senator **Stevens**. I think we have a fairly adequate antiaircraft capability, fairly adequate antisatellite capability. We have no antiballistic missile capability.

Again, I think this committee and the other committees that work on defense will be criticized if we don't urge you to get into the area of the highest vulnerability and to ask you what needs to be done to provide you the funds, the capability to get there as quickly as possible.

That leads me back to the question of that $50 million. As I understand that $50 million is not directed into the right research if it is to accent short wave at this time. Am I wrong?

Dr. **Tanimoto**. We feel that the $50 million, the way that $50 million is presented, they deleted money, $44.7 million, I think, out of the other areas. We feel that those steps are necessary in order to fully utilize or take advantage of the shorter wavelength. To go directly to development of short wavelength technology without resolution of the key optics issue, or the beam control issue properly resolved would be imprudent.

Senator **Stevens**. We show that there was $44.7 million in high energy technology and $21.8 million in Alpha, $14.2 million in Lode and $40.5 in the Air Force program. It is our understanding that this was deleted and $50 million was added to short wavelength and to the existing $35 million for Talon Gold.

Dr. **Cooper**. That is correct.

Senator **Stevens**. Jack, do you have that worked out in the conference?

Senator **Schmitt**. We had a very useful session the other day with the House people. My impression, in talking with others and the administration, is that we should be able to reach a fairly reasonable compromise in the conference. We will just have to wait and see what happens.

If it is not possible, then we are going to have another set-to on authorization and the appropriations process.

The program is too important to let it die. I hope to get DOD to move more properly on the expenditure of funds authorized in the appropriations bill than they did this year.

AVAILAPLE FUNDING TO AIR FORCE

My question is, will the $20 million be available to the Air Force?

General **Lamberson**. The answer to the question is, yes, it is available to the Air Force. The funds were released by the OSD Comptroller to the Air Force. They are still being held at the Air Force Comptroller level.

I hope it is clear, even though I am proud to wear the Air Force uniform, that I am now part of OSD and not part of the Air Force. Those funds are not being held at the OSD level. Our understanding, that is the Comptroller's understanding, is that as the House 1983 authorization bill hits the floor, an amendment to authorize the 1982 appropriation will be made which will clear that up. That is very frustrating, but that is my understanding.

Senator **Schmitt**. You are right; it is frustrating. I just can't believe that DOD is going through this rain dance. I just can't believe it.

Senator **Stevens**. Let me get to some of the problems about funding that we see downstream:

As you may recall, last year you indicated [deleted]. For air defense it would be $20 to $55 billion; [deleted]. That is over a 10-year period.

Since that period of time have we been able to refine the costs in any way as to project them out for the future?

Dr. Cooper. No, sir, we have not.

CSD STUDY ESTIMATES

I want to point out that the estimates that were made last year in the study that was done in CSD were very rudimentary estimates that were based on conceptual ideas, not even designs but concepts of what the systems might look like.

One of the issues that we will be addressing in our current program is the preliminary design of specific concepts, so that we can better understand the elements of cost that might be associated with a weapon system development.

I believe that until we get those preliminary designs under our belt and until we have had a chance to examine the elements of cost in some detail, and to further assess the maturity of the technology, that we are not going to be able to get good estimates of what the weapon system 10-year cost might be to within maybe a factor of five. That is the uncertainty, probably a factor of five. So, that clearly must be part of our program to better understand the elements of cost and to have preliminary designs that we can use as a baseline for establishing cost estimates.

ITEM COSTS

Senator **Stevens**. I had a talk with Dr. DeLauer. Let me give you my curbstone opinion on the cost of some of these things.

We have to start concentrating in some way on some of this research and take some risk, because financially we are going to be unable to keep up with all of this and pay for the development of these new systems.

Jack is running for election this year. Assuming he is successful, he will be here until 1988. I am running 2 years from now. If I am successful, I will be here in 1990, God willing.

There are not too many people who will be around to watch this continuing through. From the congressional point of view, when it is such long range it is going to get lost in comparison to the other conventional items that are coming before us. I think that is what Senator Schmitt and Senator Wallop and others are trying to emphasize. We have to have some real program and policy direction on this in the near term to assure survivability of the program in the far term.

As we look at the cost of what we are doing, we look at the cost of one battleship or battlegroup, for instance. It is appalling, really, but you are looking at $1.9 billion a year to keep that thing rolling.

We are on our third one now. When you start cranking that into a budget in 1986, 1987, and cranking in at the same time the increases you want based on policy decisions in [deleted] and [deleted] there is an ultimate limitation to the amount of money that can come out of a system such as ours for modernization and innovation if we are maintaining conventional force structures at the same time.

I do think we have to have some really tight policy and program control. We have to give you all the support you need. I want you to know I think you have more support in the near term than you have in the long term for your program. If there is anything at all that we can do to utilize that support now, we should do it.

We could accelerate this thing right now without any question if the money could be used.

The question is, can it be used efficiently? Maybe Jack disagrees with that. I see some long-term problems if we don't really build in the concentration of effort and policy and progam control now in the short term.

My urgent plea is that you do everything you can to use the support you have now in the near term. I am talking about congressional, political, public support. There is tremendous public support for this effort. I think the public would actually support overwhelmingly a project in this area. We have to rely on your answer that it is not timely.

I urge you to do everything you can to give us the information so that we can maximize our support for this program. That is our desire and I think the Senate's overwhelming desire, to do that.

Senator SCHMITT. Mr. Chairman, I think what you have said is entirely correct. Unfortunately, in rejecting the idea of a Manhattan-type project, it may also seem the Department of Defense is rejecting a program, a centralized, coordinated program. I am running into this—I am sorry to say—in other aspects of research and development in the Defense Department. There is a current diversity of authority within the Department of Defense in trying to get a coordinated program off the ground.

I recognize the background behind establishing a space command, for example, but when I look to see what the Air Force has put in space command they have not done anything except to create two new boxes in its organizational chart. We just can't do that.

If we are going to have a laser, and we intend to focus on space-based lasers—there are other lasers to which all technology is related—if we are going to have a laser weapon program, I think we have to decide we are going to do that and focus attention on it in a programmatic sense or coordination sense. Whether we call it a Manhattan project or an Atlanta project or an Albuquerque project is not so important, if we determine that is what we are going to do, and if we are going to have a sustained base of technology and we decide what is a good level of sustained base, that won't disappear when you make your decision in [deleted].

I keep hearing this: "Well, we have a program now and that program is over in [deleted] and we are going to make a decision."

What I think you have now is a sustaining technology base program. You don't have a weapon program at this point. You are trying to work out what it will take to have weapon programs. Am I correct?

Dr. COOPER. That is correct.

AIR FORCE INTEGRATION IN NEW PROGRAMS

Senator SCHMITT. I don't think it is a good idea to call this a program; it is a summary of funding or something like that. Even with the Manhattan project there was a sustaining technology base established from which weapons then grew at a fairly rapid pace. For example, we haven't really been given much insight as to how the Air Force will integrate what you are trying to do here. There is an airborne weapon system development underway in the Air Force. How does it integrate here?

Dr. COOPER. Specifically, the space-based laser weapon program has been set aside as a separate major thrust. In certain ways the activity in the rest of the high energy laser program support the space-based laser weapon program in part.

The [deleted] technology may be an example of that. By and large we have tried to set this aside as a major management issue in Defense. We have tried to formulate this program and to manage it tightly, because it has tremendous risk and great possible future potential, and we want to realize that potential with the least cost we can stand in the program, but still pushing it forward at the maximum pace that we can.

We have tried to separate it out. That does not mean that we are not paying equal attention or perhaps more attention to the rest of the program.

I believe you are right, there are at least two opportunities in front of us in the near future to define weapon application and proceed to move toward the weapon application with a development-type program.

In that regard, another of the House Armed Services Committee actions was to remove $33.1 million from the Army high energy laser program budget for fiscal year 1983. Those funds were directly related to what I believe will turn out to be the first application of high energy lasers to weaponry; that is, the [deleted] programs in the Army.

We would like to solicit your support for keeping those funds in the Army's budget and proceeding with those programs because we believe those programs could result in the first use of laser weapons in our forces, a very important step to be taken in the high energy program in which we have invested so much of our research funding in the past 20 years.

SCOPE OF NAVY PROGRAM

Senator **Schmitt**. What is the scope of the Navy program?

General **Lamberson**. The scope of the Navy program is to answer the critical question about the lethality of directed energy weapons, lasers specifically, for the defense of the fleet, which, of course, is an increasing question with the recent experience in the Falklands. They are ready to move the laser now from California to New Mexico, install it at the White Sands Missile Range, couple it with a beam director and use it there to demonstrate lethality against missiles which are more or less coming directly at you.

There is considerably more interest, as you may imagine, in the Navy at looking at those scenarios today, as opposed to 1 or 2 years ago.

If I may, Senator, I would also like to add to what Dr. Cooper has said in the way the Air Force programs may couple.

The coupling is both managerial and, I believe, technical. The agents which carry out the DARPA programs that you have heard described here today, in two out of the three programs that were described, are the same people in the Air Force Weapons Laboratory who are carrying out the Air Force program, so there is a continuity of technical leadership and management at the working level.

I think, also very important, is the integration of these laser systems, (the idea that one marries optics to a laser and somehow they all have to work together), is the lesson that we have learned best in the airborne laser laboratory that is flying out of New Mexico now. While the space environment is certainly completely different from that, the idea that precision equipment has to be integrated into a dynamic environment is a lesson that is well learned from that airplane and, I believe, in many ways is directly transcribable to the space programs referred to today.

I think the lessons of engineering, and management integration, are a result of the Air Force program.

Senator **SCHMITT**. Is it your office that is trying to look at all defense programs and making sure that there is a proper flow of information, proper integration of personnel?

General **LAMBERSON**. Yes, sir.

Senator **SCHMITT**. In the total DOD program?

General **LAMBERSON**. Yes, sir.

Senator **SCHMITT**. All services?

General **LAMBERSON**. Yes, sir.

Senator **SCHMITT**. Have you developed a block diagram or flow chart of that which shows that kind of interaction, interrelationship, with the total program?

General **LAMBERSON**. We can do that.

Senator **SCHMITT**. I think it would be very helpful for us if we could see that, and, if you can, the dollars on that chart that each area is spending, and where we find them in our budget.

General **LAMBERSON**. Certainly.

[The information follows:]

DOD HIGH ENERGY LASER PROGRAM

The Assistant for Directed Energy Weapons in the Office of the Under Secretary of Defense for Research and Engineering has staff supervision of all of the directed energy programs in the Services and the Defense Advanced Research Projects Agency. These include the Army's high energy laser program managed by the Directed Energy Directorate at Redstone Arsenal, Alabama, the Navy's program, managed by PMS-405 in the Naval Sea Systems Command, the Air Force's program managed by the Advanced Radiation Technology Office, Air Force Weapons Laboratory, Kirtland Air Force Base, New Mexico, the Air Force's program managed by the Space Division, Los Angeles, CA, the Defense Advanced Research Projects Agency's program, managed by the Directed Energy Office, and the High Energy Laser Systems Test Facility at White Sands Missile Range, New Mexico.

The following is a funding summary of the DoD high energy laser program:

[Dollars in millions]:

	Fiscal year		
	1982	1983	1984
Army:			
62307A Laser weapon technology	22.9	31.3	34.1
63304A BMD advanced technology	2.1	2.5	3.6
63314A High energy laser components	0	33.1	42.6
65806A National HEL test range	40.2	34.0	32.2
Navy:			
62735N High energy laser	57.5	63.2	69.4
62768N Directed energy	3.4	5.7	5.1
Air Force:			
62601F Advanced weapons	13.2	14.3	14.5
63605F Advanced radiation technology	75.5	95.1	92.4
63603F Space laser program	0	40.5	37.1

	Fiscal year		
	1982	1983	1984
64406F Space defense	[1] 20.4	0.4	0.5
DARPA:			
62301E Strategic technology	46.6	44.7	59.8
62711E Experimental evaluation of major innovative technology	61.5	71.0	112.3
Total	343.3	435.8	503.6

[1] $20 million was appropriated but not authorized.

MANAGERIAL PROBLEMS IN DOD

Senator Schmitt. Mr. Chairman, I really think that many of these problems are far less technical than they are managerial. I feel that way about the DOD's space programs. I feel that way here, also. We just haven't developed a way to make sure we are getting the maximum bang for our buck and still covering all bases that have to be covered.

There are a lot of bases that have to be covered and that is why I am talking about research and technology as being critical, and there has to be a long-term commitment to it. I think the Congress commitment to that is going to come, as the chairman has indicated, when we see that there is a true and major commitment on the part of this administration that has some hope of continuing into whatever administration may follow.

Senator Stevens. Not only that, we have a problem—and you and I have discussed it, Jack—in terms of our educational pipeline. We see now a declining number of people going into the area of getting advanced degrees, particularly in the sciences and engineering, that I think will be involved in this continued research, and 46 percent of those who did were nonresident aliens last year. The impact of that is that you have a decreasing base from which to work to perform the research that you are talking about in the early years, and when you expect to be increasing your concentration in this area, the number of people available for the industry you are contracting with is going to be severely restricted.

I think one of the things you ought to look at is some sort of commitment in your contracts from your contractors, not only for what they are doing, but also for them to stimulate advanced degree candidates and to literally absorp a portion of that in your budget.

Again, I am sure we will defend you to the nth degree—I know I will—if you do it. I don't think that you have the people to pick this pace up in [deleted]. There, again, the degree candidates are going to come out based on those that enter this fall.

Senator Schmitt. Not only this program, Mr. Chairman, but also many other programs that will have equally high demands in priority.

Senator Stevens. I would give this program the No. 1 priority for the whole DOD. I told Dr. DeLauer that. I think the feeling exists here that there is a future out there somewhere for a system that not only would be the ultimate weapon, but also would be the ultimate defense.

Any other questions, Jack?

NEUTRAL PARTICLE BEAMS

Senator **Schmitt**. Very quickly, is neutral particle beams part of the technology?

Dr. **Tanimoto**. It is not part of the high energy laser program; it is part of the particle beam technology program. This Department of Defense program is directed out of our office.

Senator **Schmitt**. Is that being coordinated?

Dr. **Cooper**. Yes, indeed; that is part of Don's overall charter.

Senator **Schmitt**. How much money are we putting into particle beams, a few million dollars?

Dr. **Cooper**. No, it is more like $31 million for DARPA.

Senator **Schmitt**. Platform stabilization, where does that come in? When you fire the thing, do you keep your platform stable?

Dr. **Cooper**. That is part of the [deleted] experiment; it is a major experimental issue in that program and it is something that we are working very hard on and have high hopes we will be able to achieve.

Senator **Schmitt**. Is the space-based laser program related to the space command decision in any way?

Dr. **Cooper**. Only in the sense that much of our Triad activity is managed directly by the Air Force and through the Space Division, which is now part of the Space Command.

The second aspect of the reorganization was the combination of the Geophysics Lab, the Weapons Lab and the Rocket Propulsion Lab, which should consolidate the space activity in the technology domain of the Air Force and provide a stronger base for the technology development activity at Kirtland for us. That kind of draws together the space-like activities and focuses the technology development in space at Kirtland, which is where your programs are managed substantially.

SOVIET DEVELOPMENT OF SPACE-BASED LASERS

Senator **Stevens**. Where are the Soviets now on this program? The report that we have says that the Pentagon says the Soviets are outspending the United States three to five times on laser weaponry.

General **Lamberson**. Senator, the information that we have on the Soviets is very sparse indeed. [Deleted].

[Deleted]. I believe the answer you are looking for, where do we expect their thrust to show forth, becomes more speculative.

I have looked very carefully at that kind of information and while I am not an intelligence expert, I can give you my opinion, that I believe is shared by a great many people: [deleted].

They clearly are working on those technologies, just as we are, [deleted].

That could be one possibility.

I think even a stronger candidate, which was not discussed here today, is [deleted].

Senator **Stevens**. We are spending more money on refloating one battleship in 1 year than we are spending on your program in 2 years. It doesn't seem to be a very good, balanced judgment as far as I am concerned.

Again, I encourage you to move as rapidly as you can and give us every opportunity to support what you are doing, because I think that is what the Senate wants us to do.

Thank you very much.

Dr. COOPER. We appreciate your support, Mr. Chairman.

SUBMITTED QUESTIONS

Senator STEVENS. The committee has additional questions which will be submitted for your response. They will be placed in the record at this point.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

ADDITIONAL COMMITTEE QUESTIONS

SPACE-BASED LASER FUNDING

QUESTION: Dr. Cooper, please summarize the total funding budgeted for space-based lasers technology and give us that grand total. How does the 1983 total compare to 1982 and 1981 fiscal years?

ANSWER: Total funding in millions of dollars is as follows:

FY 1981	FY 1982	FY 1983
57.8	114.6	139.4

QUESTION: For the record, please supply a precise, side-by-side comparison of all Defense Department funding for all space-based laser work for FY 1982, budgeted for FY 1983, and projected for FY 1984. Provide figures to the budget activity and program level.

ANSWER:

	(Dollars in Millions)		
	FY 82	FY 83	FY 84
Budget Activity 1			
62601F Advanced Weapons	4.7	7.6	6.1
62301E Strategic Technology	25.9	17.3	16.9
62711E Experimental Evaluation of Major Innovative Technology	61.5	71.0	112.3
Budget Activity 2			
63603F Space Laser Program	-	40.5	37.1
63605F Advanced Radiation Technology	-	-	-
Budget Activity 3			
63304A Ballistic Missile Defense Advanced Technology Program	2.1	2.5	3.6
64406F Space Defense	20.4*	0.4	0.5
TOTAL	114.6	139.4	176.5

Note: The Submarine Laser Communications program is not included in the above figures.

$20.0M were appropriated but not authorized.

QUESTION: Does the fact that the laser programs have come to take up such a large percentage of the DARPA budget tend to act as a bureaucratic brake on future laser program growth?

ANSWER: While the directed energy programs have grown to approximately 25% of the DARPA budget we at DARPA continue to pursue those efforts which we believe to have the highest payoff independent of any arbitrary ceiling in a given area. In the space laser area, any major increase in funding would be (deleted.) That is in fact the intention as described in the comprehensive DoD Space Laser Plan which I mentioned earlier.

QUESTION: Dr. Cooper, you state that significant uncertainties exist with respect to the military capabilities of space based lasers, and that the current DoD program is gearing up to an end of (deleted) decision date on whether to initiate weapons development. Is it technically feasible to resolve the uncertainties you mention - such as the projected weapon performance levels, ultimate weapon effectiveness, and growth capability of the technology - earlier than (deleted.)

ANSWER: It would be difficult to resolve all the (deleted) uncertainties I identified in a manner to provide a basis for a prudent decision on weaponization before (deleted.) In particular the projected performance and technological growth capability depend heavily on the DARPA TRIAD technology demonstrations of the Alpha chemical laser, the LODE optics and beam control experiment, and the Talon Gold pointing and tracking experiment all of which reach fruition (deleted.) Assessment of weapon effectiveness requires a more complete definition of the system concept and evaluation of hardening and survivability options which is a key part of the Air Force SBL activity just getting underway.

QUESTION: You mention that the short wavelength laser effort has near term applications in communications with submarines. How does this relate to blue-green laser communications?

ANSWER: The development of excimer lasers in the DARPA Short Wavelength Laser Program directly supports the Submarine (or Blue-Green) Laser Communications Program. Current plans call for the development of a ground based (deleted) excimer (Xenon Fluoride) laser which may (deleted.) The output of this laser can be converted rather easily to the blue-green region of the spectrum with high efficiency. When the blue-green beam from this device is reflected from an orbiting relay mirror, this same device can provide strategic communications to submarines at data rates (deleted.) The development of the (deleted) Xenon Fluoride laser is funded by the Short Wavelength Laser Program. The technology for conversion of this device to the blue-green and the relay mirror technology is funded as part of the Submarine Laser Communications Program.

QUESTION: You mention that the short wavelength technology is (deleted) HF/DF technology. Would application of the $20 million proposed by the House Armed Services Committee to short wavelength lasers narrow this gap?

ANSWER: We believe that the current program as represented by our FY 1983 budget request is a properly balanced effort to bring both short wavelength and chemical laser technologies along at a prudent pace. It is too early, for example, to (deleted.)

QUESTION: Four potential missions for space based chemical lasers are: anti-aircraft, satellite defense, anti-satellite and ballistic missile defense. Given current state-of-the-art for space based laser technology, which mission appears most promising?

ANSWER: From our current understanding of the scalability of chemical laser technology, we believe that (deleted.)

SPACE BASED LASER PROGRAM ACCOMPLISHMENTS

QUESTION: Has our current program demonstrated beam quality, high power, high efficiency, and lightweight capability?

ANSWER: Each of these features, (deleted.)

QUESTION: How many (deleted) laser devices are now in operation?

ANSWER: The following is a list of (deleted) lasers, and their respective power levels, currently in operation:

Laser	Power (Deleted)	Location
Mid Infra Red Advanced Chemical Laser (MIRACL)	(deleted) (deleted)	TRW
Navy ARPA Chemical Laser (MACL)	(deleted) (deleted)	TRW
Modular Army Demonstration System (MADS)	(deleted) (deleted)	TRW
Baseline Demonstration Laser (BDL)	(deleted) (deleted)	TRW

The MIRACL is currently being dismantled for shipment to the White Sands High Energy Laser Test Facility as part of the Navy Sea Lite Program. The laser will become operational again in (deleted.)

QUESTION: What tasks will have to be undertaken to integrate these technical elements in a (deleted.) Please provide an itemized list.

ANSWER: Upon completion of the DARPA TRIAD program, the following must be done: (deleted.)

QUESTION: What would be the capability of (deleted) respectively?

ANSWER: Simplified analyses sponsored by DARPA suggest that (deleted.)

QUESTION: Do we now have good information about making laser weapons militarily effective: What do we know about retarget time? beam jitter? beam quality? How much more work is needed in these areas?

ANSWER: The feasibility of the (deleted.)

All of these efforts, including the TRIAD technology programs, laser weapon system definition, target vulnerability, and hardening, laser platform survivability, and utility analyses, form the core of the DoD Space Laser Program to be conducted through (deleted.) At that time the DoD will have the data available to make an informed decision on the future course of space laser development.

QUESTION: How soon could we begin (deleted.)

ANSWER: The basic technologies necessary for (deleted.)

QUESTION: Given current technology, is it feasible to build (deleted) laser for space?
ANSWER: Progress over the last three years in (deleted.)

QUESTION: Would an SBL anti-satellite system have any significant cost or technical benefits over the current miniature (deleted) vehicle ASAT program?
ANSWER: If deployed (deleted.)

QUESTION: The anti-aircraft mission appears to be the most promising SBL mission. Could a successful anti-aircraft SBL have some potential ASAT capability?
ANSWER: In general a constellation of SBLs deployed for the anti-aircraft mission would (deleted.)

QUESTION: As we discuss potential mission applications, it is important to know if the mission analyses for space based lasers has been complete. Can you provide us a candid assessment of the comprehensiveness of the mission analyses?
ANSWER: The mission analysis to date has concentrated (deleted.) Reduction of those system-related uncertainties such as enemy countermeasures and hardening, survivability of the SBL, utility, and cost effectiveness as compared with other approaches to accomplishing the mission are the central activity of the Air Force task in the DoD Space Laser Master Plan. An initial assessment which includes these broader considerations will be available in FY (deleted) to support the interim decision milestone in the DoD plan.

QUESTION: Have these questions been adequately studied?
- target vulnerability
- target surveillance
- weapon command and control
- SBL system vulnerability to attack

ANSWER: No. This list comprises the major uncertainties identified by the DoD Space Laser Study which prohibit an informed decision today on whether to proceed directly to laser weapon system development. Consequently, these uncertainties, coupled with the feasibility of the projected laser performance levels, from the basis of the DoD Space Laser Plan submitted to the Congress this year. It is the objective of the plan to resolve those uncertainties by (deleted) and thus provide the basis for a decision on whether or not to proceed to weapon development.

QUESTION: Given current mission analyses, does the candidate laser system appear to be (deleted).Which system would have the larger development time?
ANSWER: The proper weapon-level entry point appears to be the (deleted) system. Deployed in the appropriate numbers, this system would provide the capability to (deleted.) The development time for the larger system would be slightly longer (deleted.)

QUESTION: The House Armed Services Committee wants to add $50 million for short wavelength laser technology, and zeroed the ALPHA chemical laser program. What laser technology is closest to actual demonstration and deployment, long wavelength chemical lasers or short wavelength lasers?

ANSWER: The infrared chemical laser technology is (deleted.)

QUESTION: What are the advantages of using shorter wavelengths over chemical lasers?

ANSWER: The advantage of shorter wavelengths is that the diffraction spread is smaller allowing concentration of laser energy at longer ranges if the mirror diameter is kept constant or at comparable ranges with smaller diameter optics. However, exploiting this potential advantage requires reducing the tracking and pointing jitter, the optics phase errors, and the laser beam phase distortions in proportion to the decrease in the wavelength. Currently, the short wavelength approach would (deleted.)

QUESTION: What optics issues remain unresolved for short wavelength lasers?

ANSWER: In the Excimer Laser Program, (deleted) at Xenon Fluoride wavelengths. This performance is (deleted) excimer lasers. However, these coatings have not yet been tested under repetitive pulse conditions. This testing awaits the development of (deleted.) This device will also allow testing of cooled substrate technology which is compatible with producing and maintaining the ultra-precise mirror surface figure control necessary at short wavelengths.

In the Free Electron Laser Program, transmissive or reflective optical techniques (deleted.) There are several promising candidates for beam expansion optics including flowing gas and liquid lens concepts which to date have not been developed or tested. These concepts will be developed as part of the DoD Space Laser Program.

QUESTION: Can current mirror technology take advantage of short wavelengths?

ANSWER: Current mirror technology if it can be (deleted) may be adequate for development of high average power excimer lasers. Subscale versions of this technology will be tested in 1984. Current mirror technology is (deleted.) This technology will (deleted) in the DoD Space Laser Program.

QUESTION: Has a beam quality capability for excimer lasers been demonstrated?

ANSWER: All of the components contributing to (deleted.) These experiments indicate that (deleted) excimer lasers. The construction of (deleted.) The optical beam quality available from this device will be measured at that time.

QUESTION: Do major physics and engineering issues still remain to be resolved before the feasibility of using free electron lasers can be established?

ANSWER: There are a number of physics and engineering issues to be resolved before (deleted.) The highest risk areas are (deleted) free electron lasers. The first two of these issues will be resolved experimentally in FY (deleted.) Optical resonator technology will be developed (deleted) as part of the DOD Space Laser Program and test on (deleted.)

QUESTION: What kinds of electrical power generation problems are we encountering with short wavelength laser technology?

ANSWER: For ground based applications of excimer and free electron lasers, which include Submarine Laser Communications (deleted) electrical power generation is not an issue. Commercially available electrical generators can be used for these applications.

For space based applications of (deleted.) In the nearer term, combustion of conventional fuels followed by electrical conversion with superconducting turbo-alternators can be utilized to generate (deleted.) The Air Force and DARPA are developing such electrical generators with a ground demonstration of (deleted.) In the farther term, (deleted.) Although high risk, these (deleted.) We project that these technologies, if feasible, could be available in (deleted.)

QUESTION: What kind of improvements need to be made in pointing and tracking before we can start taking advantage of shorter wavelengths?

ANSWER: The Talon Gold Program, which is developing (deleted) pointing and tracking technology for (deleted) provides the basis for (deleted) point (deleted) in space. However, Talon Gold capabilities (deleted) of shorter wavelengths. Talon Gold will demonstrate in (deleted) the capability to point and track (deleted.) Second generation applications, (deleted.) As a first step in developing these more accurate pointing and tracing systems, in the DoD Space Laser Program has initiated an effort to develop (deleted.)

QUESTION: Has beam quality for excimer and free electron lasers been measured? Has beam quality been measured for long wave length chemical lasers?

ANSWER: All of the components contributing to (deleted).

QUESTION: Is it likely that large additions of funding for short wavelength laser R&D, as proposed by the House Armed Services Committee, will result in any definitive breakthrough in this technology?

ANSWER: We believe that the current program as represented by our FY 1983 budget request is a properly balanced effort and will lead to a timely resolution of all major areas of technical risk in the short wavelength laser program. (Deleted.)

QUESTION: (Deleted.)
ANSWER: (Deleted.)

QUESTION: (Deleted.)
ANSWER: (Deleted.)

QUESTION: What protection would be required (deleted.)
ANSWER: (Deleted.)

SOVIET ASAT THREAT

QUESTION: Could existing Soviet ASAT technology be capable of destroying any of the space-based laser battle stations we are not contemplating?

ANSWER: (Deleted.)

SOVIET SPACE-BASED LASER

QUESTION: Do we have any evidence of a major Soviet Space-Based Laser effort?
ANSWER: (Deleted.)

AIRBORNE LASER LAB

QUESTION: The objectives of the Air Force space based laser program is to provide the technology for weaponization of high energy laser systems. What have been the major accomplishments to date of the Airborne Laser Lab?
ANSWER: The Air Force Airborne Laser Laboratory is the foremost DoD test bed for demonstrating the feasibility and lethality of high energy laser weapons. This test program is significant because (1) it has demonstrated the integration and operation of high energy laser components in a dynamic airborne environment, (2) it is providing a technology base for the further development of high energy laser weapons for Air Force applications, and (3) it will demonstrate the effectiveness of high energy lasers against targets in a realistic environment. Specific accomplishments to date are the flight certification and first airborne operation of a high energy laser, the precision tracking of air-to-air and ground-to-air missiles, the first in-flight propagation of destructive laser energy to a tow target, and the initial engagement of supersonic air-to-air missiles with a high energy laser beam.

SPACE LASER PLATFORM

QUESTION: How close is the Air Force Space Division to finalizing system requirements for a space laser platform and platform subsystem?
ANSWER: As outlined in the "DoD Space Laser Program Plan" submitted to Congress by the Secretary of Defense on June 21, 1982, initial requirements will be completed (deleted.) The initial requiements will be used to define the space laser weapon utility, technical feasibility, and cost effectiveness. The finalized system requirements for space laser platform and platform subsystem will be completed in FY (deleted) provided that commitment is made for a space demonstration.

QUESTION: Do only conceptual designs of actual space based laser platforms actually exist?
ANSWER: (Deleted.)

QUESTION: Does this add to the uncertainty in projecting space based laser cost estimates?
ANSWER: Yes. That plus uncertainties in potential countermeasures and hardening make it impossible to estimate system costs with any degree of certainty.

DATE OF SOVIET LASER DEMONSTRATION

QUESTION: How soon do we project that the Soviets could have an on-orbit demonstration?
ANSWER: (Deleted.)

QUESTION: How serious would be (deleted.)
ANSWER: (Deleted.)

QUESTION: Have we investigated the threat that long-range nuclear explosions and electromagnetic pulse (EMP) would have on space based lasers?

ANSWER: We have a vigorous program in cooperation with the Defense Nuclear Agency to understand the nuclear weapons effects on satellites and on potential space based weapons systems. The degree of nuclear hardness achievable for tnese systems is a major driver in the defense costs (deleted.) We expect to understand the implications of nuclear and EMP threats (deleted.)

QUESTION: It is basically DARPA's position that no credible basis exists today to make an intelligent decision on whether to develop a space based laser weapon?

ANSWER: We believe, it would be imprudent to commit to weaponization at this time until the basic technical feasibility is established and the uncertainties in vulnerability, hardening, countermeasures, C^3, battle management, utility, and cost effectiveness are reduced substantially.

QUESTION: Is it prudent to hold off on the laser weapons process, given the large degree of uncertainty about Soviet technical achievements and the fact that they are investing three to five times as much in this areas as we are?

ANSWER: The high energy laser program is this country's largest single technology program. While the Soviets may be investing larger sums we believe (deleted.) The DoD Space Laser Plan is geared to establishing feasibility at the required performance levels and to reducing uncertainties as to the most effective approach to pursue.

QUESTIONS SUBMITTED BY SENATOR STENNIS

QUESTION: Dr. Cooper, the House Armed Services Committee has recommended drastic reductions in the program for development of chemical lasers. In your opinion, what would be the impact of these reductions on the Nation's space laser effort?

- Could you say that it is possible that these reductions would effectively curtail any alternative to have a space based laser program deployed prior to the end of this century?
- What about curtailment of the DARPA TRIAD Program? Wouldn't this also have the effect of ensuring that the United States will not have a space based laser program prior to the end of the century?

ANSWER: The House Armed Services Committee has recommended termination of the ALPHA chemical laser program and the Large Optics Demonstration (LODE) Program at the end of FY 1982. Termination of the ALPHA program would (deleted.)

Termination of the LODE program and/or the TALON GOLD effort would in effect (deleted.)

QUESTION: There have been numerous articles printed recently which discuss the potential of short wavelength laser devices. What do you estimate would be the period of years before these lasers could be at a comparable stage of development that longer wavelength lasers are today?

ANSWER: We estimate that the technical feasibility of (deleted.) Therefore, short wavelength laser technology, (deleted) would be at a comparable stage of development that longer wavelength lasers are today in (deleted.)

QUESTION: How much have be expended to date on development of chemical lasers? In your opinion, could one make the point that these funds were used wisely if the program is essentially curtailed at this time?

ANSWER: To date the DoD has spent approximately $300M on the development of chemical laser technology for all potential applications, (deleted.) Terminating this space-based portion of this technology now would call into serious question the wisdom of the investment strategy adopted over the past several years (deleted.)

QUESTION: We started the DARPA TRIAD Program in 1979 and it is now the most mature laser technology element of our space laser program. There appears great evidence that the Soviets are much further than we are. When would you estimate that the Soviets started their space laser efforts?

ANSWER: (Deleted.)

QUESTION: Would you tell us what you hope to achieve from the TRIAD Program?

ANSWER: We hope to conclusively estalish the technical feasibility of the performance levels required for space laser weapon systems. Specifically, the ALPHA Program will address (deleted.) The TALON GOLD Program will establish the feasibility of the acquisition, tracking and precision point functions (deleted.) Finally, the Large Optics Demonstration Experiment (LODE) will resolve (deleted) beam control issues: first, the sensing and control of optical wavefront aberrations to extremely high tolerances; and second the fabrication and control (deleted) used to project the laser beam.

The technical issues being addressed in these three programs represent the major uncertainties in the projected performance of space laser systems.

QUESTION: Isn't it true that funding limitations on this program have caused performance reductions and schedule slippages?

ANSWER: In terms of performance, two changes have been implemented. First in TALON GOLD, the original (deleted.) However, TALON GOLD has still retained the acquisition function. This has allowed us to eliminate an element of high risk to focus entirely on the issues generic to acquisition, tracking and pointing systems for space lasers. In other words, this has allowed us to reduce risk without affecting the objectives of the program.

Second, in ALPHA, we have eliminated one of the two optical resonators to be fabricated and tested. This change certainly has had a cost impact, but it was driven by tecnical considerations. Specifically, one of the resonators was (deleted.) In addition, our confidence in the other resonator design has increased to the point where we project laser performance well beyond (deleted.)

With regard to program schedule, we have made adjustments as the progams have progressed from the conceptual to the detailed design phase. Our goal has been to strike a prudent balance between a success-oriented schedule and programmatic risk. We feel we have achieved that balance.

QUESTION: Is it your opinion that these delays will have implications later as future efforts require findings from the TRIAD Program?
ANSWER: It is our opinion that an informed positive decision on the weaponization cannot proceed without completion of the TRIAD Programs. Thus any slip in the schedules will have a direct impact on the entire program. That is why we have gone to great lengths to determine the most aggressive yet realistic schedule for each element of the TRIAD. We plan to make every attempt to maintain those schedules without compromising objectives of the program.

QUESTION: Is it your opinion that space based laser weapons can be as cost effective as other weapons that can also perform the same mission?
ANSWER: Due to lack of detailed definition of the weapon system concepts and major uncertainties in areas of vulnerability, hardening, countermeasures, survivability, surveillance requiements, battle management, and C^3 we are unable at present to provide even rough estimates of space based laser weapon system cost effectiveness as compared to other ways of accomplishing the mission. This is one of he important goals of the DoD Space Laser plan with initial results to be available by (d) and definitive estimates by (d) .

QUESTION: Have you considered the outlook for these weapons to maintain mission effectiveness when faced with active and passive countermeasures?
ANSWER: That is one of the major issues which the DoD Space Laser Program is designed to resolve. One of the highest priority efforts will be a red team/blue team assessment (deleted.)

QUESTION: Would additional funds assist in providing for an earlier space based laser or are we essentially technology bound to our current projections?
ANSWER: While technical risk could perhaps be reduced by funding parallel efforts, I believe that the current program of system-related uncertainty reductions coupled with technology advancement is the most prudent approach to resolving the issue of the ultimate utility of space laser weapons and to providing a basis for an informed decision in FY (deleted) on whether or not to proceed with weapon development.

QUESTION: Isn't it true that this is essentially a funding limited apprcach which risks keeping the potentially revolutionary technology in component development for the foreseeable future?
ANSWER: There are risks both in proceeding too slowly and in committing too early to an approach which may be less effective than other ways of accomplishing the mission. By focusing on both system related issues to establish utility and cost effectiveness and on technology issues to establish

technical feasibility and scalability, we hope to avoid either extreme and provide a sound basis for an FY (deleted) decision on weaponization.

QUESTION: Would you say that the Department of Defense is making any effort to establish priorities in the high energy laser technology development program. In other words, are programs being prioritized toward meeting specific national security needs?

ANSWER: Yes, we are. Not only are the programs evaluated against their potential to meet national security requirements but I have also moved to centralize the management of the high energy laser efforts by establishing the office, headed by Major General Lamberson, at the Office of the Secretary of Defense level to assure the pace of the program is maintained adequately and that the funds are expended in a responsible way consistent with the potential impact on our future defense needs.

QUESTION: Have any specific needs been identified that high energy laser weapons could meet more effectively than existing weaponry?

ANSWER: Yes. (Deleted.)

QUESTION: Is it your opinion that current laser technologies will support a space based laser system that will be both effective and affordable?

ANSWER: I believe that the current technology efforts in chemical lasers, optics, and tracking and pointing will establish the feasibility of space-based weapons at performance levels which are required for a broad range of applications. The ultimate utility and cost effectiveness of such potential weapons systems will be evaluated as part of the DOD Space Laser Program with initial indications available as early as FY (deleted).

QUESTION: The General Accounting Office has recommended that the Secretary of Defense establish a Space Based Laser program plan containing clear and specific milestones and objectives which recognize the relative priority of these programs within DOD. Do you believe that this recommendation is being incorporated in current Defense plans?

ANSWER: Yes. We have structured the program to focus on those major issues which must be resolved before a decision on the weaponization of this technology can be made. We have also included several milestones throughout the program to assist us in monitoring the progress. Finally we have placed considerable emphasis on the management of the program to ensure thorough, objective assessments, particularly in the most controversial area of weapon effectiveness. In our opinion, the plan is wholly consistent with the recommendations of the General Accounting Office.

DEFENSE AGENCIES

(Clerk's Note: The following prepared statements were submitted by those Defense Agencies not present at the hearings:)

DEFENSE COMMUNICATIONS AGENCY

PREPARED STATEMENT OF LT. GEN. WILLIAM J. HILSMAN, USA
DIRECTOR

INTRODUCTION

Mr. Chairman and Members of the Committee:

I am pleased to have this opportunity to present to you the Defense Communications Agency budget request for fiscal year 1983.

DEFENSE COMMUNICATIONS AGENCY RESPONSIBILITIES

The Defense Communications Agency (DCA) is responsible for (1) system engineering, overall planning and operational direction of the Defense Communications System (DCS); (2) providing system engineering and other technical support to the National Military Command System (NMCS); (3) supporting the Joint Chiefs of Staff in carrying out their responsibility for the Worldwide Military Command and Control System (WWMCCS) standard automatic data processing systems; (4) providing system engineering and technical guidance for implementation of the WWMCCS architecture; (5) system engineering of the Minimum Essential Emergency Communications Network (MEECN); and (6) developing system architecture for all military satellite communications systems. In addition, the Director of DCA has separate and distinct responsibilities as Manager of the National Communications System (NCS) and Chairman of the Military Communications-Electronics Board.

BUDGET SUMMARY

The Defense Communications Agency budget estimate for fiscal year 1983 is $338.6 million in three appropriations as shown on Chart 1. My statement will highlight significant elements of the estimate. Additional explanation is included in the justification material which was furnished separately.

SUMMARY OF DCA BUDGET
($ in Millions)

APPROPRIATION	FY 1981	FY 1982	FY 1983
Operation and Maintenance	$122.7	$163.9	$192.6
Procurement	6.9	19.9	38.3
Military Construction	0	.9	0
Research, Development, Test and Evaluation	52.6	105.3	107.7
Total	$182.2	$290.0	$338.6

CHART 1

OPERATION AND MAINTENANCE

Operation and Maintenance funds are requested for the operating costs of the DCA Headquarters and the field activities through which DCA carries out its operational responsibilities. The request for fiscal year 1983 is $192.6 million, an increase of $28.7 million over the current estimate for fiscal year 1982. This increase includes $10.2 million for price growth of goods and services.

For DCA Headquarters support, we are requesting $17.2 million, which is $717 thousand more than the current estimate for fiscal year 1982. This increase is the result of a reasonably foreseeable growth in the price of goods and services, and additional costs of facilities maintenance upkeep. For the operating costs of our world-wide DCS field activities, we have requested $49.5 million, an increase of $2.3 million above the fiscal year 1982 amount.

In support of the National Communications System (NCS), $51.0 million is requested, an increase of $17.5 million over the current estimate for fiscal year 1982. This increase includes $2.2 million for the price of goods and services and $15.3 million program growth associated with Presidential Directive 24 efforts to provide for National telecommunications security.

For the WWMCCS Automatic Data Processing (ADP) Joint Technical Support Activity (JTSA), which provides centralized technical automatic data processing support to the Joint Chiefs of Staff and the WWMCCS commands, we are requesting $19.9 million, a net increase of $1.6 million over fiscal year 1982. This increase will provide increased standard system software development and maintenance support to the WWMCCS ADP community.

For ADP support of the NMCS, we are requesting $30.7 million, an increase of $2.0 million from fiscal year 1982. This program growth is to meet increased operational requirements of the Joint Chiefs of Staff, Office of the Secretary of Defense, and other Department of Defense activities for mission essential requirements. In support of NMCS, in areas other than data processing, we are requesting $7.9 million to continue near-term NMCS enhancements required to improve the readiness posture of the Joint Chiefs of Staff.

To support WWMCCS System Engineering, we are requesting $12.9 million which is $4.7 million more than the fiscal year 1982 requirement. The increase of $4.7 million is for long range planning and systems engineering of future Command, Control, and Communications systems to ensure responsiveness, reliability and endurance.

In support of the Commanders in Chief (CINC) Command and Control Initiatives Program, $2.7 million is requested. Funding under this program permits the CINCs to tailor, by means of near-term low-cost enhancements, their unique and dynamic command and control systems to their own particular missions, geographic areas of responsibility, and individual styles of command.

PROCUREMENT

The fiscal year 1983 Procurement request is $38.3 million. This amount includes $8.1 million for improvement of WWMCCS automatic data processing (ADP) systems which support the Joint Chiefs of Staff, the Office of the Secretary of Defense and the WWMCCS commands. Within the WWMCCS request is $7.1 million to upgrade the ADP systems of the National Military Command Center (NMCC) and its alternate and to increase the capacity and responsiveness of the processing and display systems. The WWMCCS ADP request also includes $1.0 million for the Joint Technical Support Activity (JTSA) to acquire ADP equipment necessary to continue providing responsive support to WWMCCS community generated requirements for standard system software.

The remainder of the Procurement request is $30.2 million for items less than $900 thousand each. Major procurements include $6.5 million for Commanders in Chief Command and Control (CINC C^2) initiatives; $9.9 million to improve our nuclear endurable communications by procurement of 13 airborne terminals and four ground terminals for the MEECN; $8.5 million for voice security and record communications; and $3.6 million for other support equipment required for the operational direction of the DCS. The remaining $1.7 million is requested for normal replacement and modification of equipment and systems used by DCA Headquarters and other communication activities.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION (RDT&E)

RDT&E funds are requested to provide system engineering, architectural development, and ADP support for WWMCCS; provide system engineering support to NMCS, MEECN and the DCS; and to develop and implement the objectives of Presidential Directive 53 into the NCS. The request for fiscal year 1983 is $107.7 million, $2.5 million over the current year's estimate.

For WWMCCS System Engineering, we are requesting $43.7 million. Of this amount, $14.7 million will be used to continue developing planning guidance for Command, Control, and Communications (C^3) systems, technical and architectural plans and special studies of C^3 problems and issues, and the development of protocol standards for common-user computer communications networks for interoperability of our information systems. The remaining $29.0 million is for programs to develop capabilities to enhance the post-nuclear attack survivability and endurance of WWMCCS.

To continue WWMCCS Architecture efforts, $1.3 million is requested. This program provides a continuing overview of the characteristics of the WWMCCS in view of changes in the environment, threat, force structure, technology and U.S. defense policy and develops conceptual system improvements and modifications in response to these changes.

For WWMCCS ADP Joint Technical Support Activity (JTSA) efforts, $23.4 million is requested, an increase of $9.1 million above the FY 1982 estimate. The increase reflects increased funding to support the development of a Command Information Subsystem (CIS) and required support to the WWMCCS Information System (WIS) Joint Program Management Office (JPMO) recently established within the Air Force to manage all WIS modernization efforts in DoD. Other efforts within this program include developing, implementing, and evaluating networking techniques and capabilities to enhance the exchange of criticial command and control information for both near-term and future WIS requirements; focusing on transitioning the WWMCCS Intercomputer Network from its currently dedicated communications sub-network to a more survivable DoD common-user, packet-switched network; developing a DoD standard interface device to connect host computers to the common-user, packet-switched network; identifying, and demonstrating ways to improve ADP support to the WWMCCS during crises; and developing certain advanced ADP concepts so that they are applicable to and compatible with the WIS, such as, local and long haul ADP network enhancements, new capabilities in computer performance evaluation and more effective man-machine graphic interfaces.

To continue providing overall systems engineering support for the development and integration of the NMCS, $7.9 million is requested. NMCS is comprised of the National Military Command Center, the Alternate National Military Command Center and the National Emergency Airborne Command Post (NEACP). This program includes integration of new generation WWMCCS ADP capabilities into NMCS; participation in design and development of a new Command Center Processing and Display System; and increased development efforts on communications and information processing enhancements for NEACP.

For system engineering, development, test, evaluation and technical support of MEECN, $9.8 million is requested, an increase of $3.3 million over the fiscal year 1982 estimate. Of the $3.3 million increase, $3.0 million is for Strategic Connectivity Engineering which provides for increased emphasis on endurance of strategic communications and associated assets supporting reconstitution of command and control connectivity in trans and post-attack environments. The remainder of the program provides in-depth operational testing and analysis of MEECN assets with emphasis upon their survivability and connectivity in a stressed environment.

To continue the ongoing development and systematic improvement of DCS Long Haul Communications, $18.9 million is requested, an increase of $.7 million from the fiscal year 1982 estimate. This program is directed toward removing critical deficiencies in endurability, survivability and responsiveness of the DCS, including the Defense Satellite Communications System (DSCS). Major projects include: (1) Continued evaluation and updating of system technical standards for the DCS to insure interoperability with other communications systems in DoD, related systems within NATO and other Allied nations, and with commercial communications systems; (2) Development of a wartime-oriented design for the DCS to facilitate rapid extension and flexible reconfiguration, (3) Continued development of the Secure Voice Improvement Program to provide improved and expanded secure voice service with full interoperability; (4) Development of the Defense Switched Network (DSN) to achieve full integration of DoD base, camp and station communications with the long-haul capabilities afforded by commercial as well as military facilities; (5) Implementation of a Jam Resistant Secure Communications system for critical users, during crisis and war, using the DSCS satellites; (6) System design and testing for the DSCS; and (7) Development of an overall DoD satellite communications systems architecture to ensure maximum interoperability and compatibility among different DoD satellite systems and other military and commercial communications systems.

The fiscal year 1983 request for the NCS is $2.0 million. These funds are requested to continue efforts initiated in fiscal year 1982 under Presidential Directive 53 to increase the survivability and endurability of national telecommunications assets.

CONCLUSION

Mr. Chairman, this concludes my prepared statement. I am ready to respond to your questions.

DEFENSE LOGISTICS AGENCY

PREPARED STATEMENT OF VICE ADM. E. A. GRINSTEAD, JR., SC, USN

DIRECTOR

Mr. Chairman and Members:

I appreciate the opportunity to appear before you and to present the Defense Logistics Agency's FY 1983 resource requirements.

I would like to highlight for you the nature and scope of Agency operations and summarize the operation and maintenance funds needed to accomplish our various missions.

Nature and Scope of Operations

The Defense Logistics Agency is an integral part of the DoD logistics system and a full partner in military force readiness. We support U.S. military forces world-wide in three major areas -- providing consumable items, administering contracts and managing surplus property reutilization and disposal. We also operate a number of Defense-wide logistics programs including:

-- The Federal Catalog System for identifying and providing descriptive and technical data on items of supply.

-- The Government-owned industrial plant equipment effort in which we maintain, store and promote the reuse of such equipment.

The Agency's responsibilities are widely diverse as is indicated by the following annual workloads:

-- Buying and supplying virtually all of the fuel, food, uniforms and medical supplies and about half the hardware items used by the Military Departments.

-- Filling over 30 million requisitions each year.

-- Receiving and shipping more than 19.3 million line items at our depots.

-- Administering 324 thousand contracts.

-- Managing reutilization and disposal of surplus property having an acquisition value of $4.9 billion.

DLA - A Partner in Readiness

While DLA items are often not the most sophisticated or exotic they nevertheless are crucial to many of the major weapons systems operated by the Military Services. DLA's performance statistics are also impressive; our supply availability, for example, has consistently been above the DoD average while on-time performance by our depots is in the 97 to 98% range. During the first three quarters of FY 1981, DLA's supply availability was 90.5% while the DoD total was 86.9%. We focus special management attention on weapons systems-related items through our Weapons System Support Program (WSSP). This program provides for stockage and priority allocation of resources to items identified by the Military Services as important to specified weapons system. There are currently over 250,000 different items identified to approximately 130 weapons systems in this support program. Examples of systems which DLA supports include the F-15, the F-14, TRIDENT, Black Hawk Helicopter, M-1 ABRAMS Tank and the FFG-7 (Fast Frigate). For the F-15 alone, we have identified over 47,000 items that we manage in support of that first line aircraft. Another example of the importance of DLA support to our major weapons systems -- the allowance list of our aircraft carriers includes over 78,000 line items of consumable spare parts. DLA is responsible for 56,500 or over 72% of them. There are, as I previously indicated, a total of approximately 130 weapons systems in which DLA items are important contributors to military force readiness. We have a number of initiatives planned which will further enhance our effectiveness in this area. Major among these is the development and implementation of a Materiel Readiness Support (MARS) Model which will measure effectiveness, depth of readiness, and provide the capability to redirect resources to areas requiring improvement.

Resource Summary

DLA workloads over the last several years have been increasing at about five percent per year. At the same time our employment has declined from a high of nearly 61 thousand in FY 1967 to a requested authorization of approximately 48,900 in FY 1983. We have managed to accomplish our increasing workloads with fewer people because of the success of our aggressive productivity improvement program. This effort, which takes the form of increased automation, depot mechanization and organizational streamlining, has enabled us to continue to be responsive to the military departments despite the reduction in personnel levels.

FY 1983 Appropriation Request

We are requesting $1,388.976 million in FY 1983 for our operation and maintenance appropriation. Our FY 1983 estimate assumes that our workload will continue to increase at the 5% rate. The increase in military force levels, activity and procurement programs will have an impact on our supply activities as well as our Contract Service Regions. Our workload will also increase because of the transfer to DLA of the management responsibility of some 200,000 consumable items. Our budget also assumes that we will be able to offset some of this workload increase with further increases in productivity of about 2% per year in both FY 1982 and FY 1983.

Employment

About 80% of our O&M costs are for civilian salaries. We estimate that we will require about 48,900 personnel to accomplish our FY 1983 workload, an increase of about 600 over the currently authorized levels. The majority of these personnel will be used in our 6 Supply Centers, 6 Depots and 9 Contract Administration Services Regions.

Other Appropriations

Mr. Chairman, I would like to briefly address our other appropriation requirements.

Procurement

Our FY 1983 request for procurement is $24.651 million. These funds will be used to purchase items such as materials handling equipment, replacement automotive vehicles and other such equipment required in our ongoing operation.

Military Construction

We are requesting $85.130 million for our Military Construction Program in FY 1983. In addition to normal requirements, this will provide funding for four major projects -- three overseas and one in CONUS. The CONUS project is for construction of a property disposal office on Elmendorf Air Force Base in Alaska at an estimated cost of $2.700 million. The overseas projects include $5.1 million for additional cold storage in Kaiserslautern Germany, $29.0 million for additional JP-4 fuel storage in the Republic of Korea, and $43.9 million for JP-4 storage on the island of Guam.

Research, Development, Test and Evaluation

DLA does not perform research and development as such. We do, however, operate the Defense Technical Information Center which provides information on completed and ongoing projects to the RDT&E community. In addition, ten contractor-operated Information Analysis Centers are operated. These centers collect, store and disseminate scientific and technical information in highly specialized fields. We are seeking $22.700 million in FY 1983 for these purposes.

Conclusion

Mr. Chairman, this concludes my prepared statement. I will be pleased to respond to any questions you may have.

DEFENSE MAPPING AGENCY

PREPARED STATEMENT OF MAJ. GEN. RICHARD M. WELLS, USA

DIRECTOR

Mr. Chairman and members of the Committee:

INTRODUCTION

I welcome this opportunity to present to you the fiscal year 1983 budget request of the Defense Mapping Agency (DMA).

Today, I will talk about our mission and major objectives; a change in the DMA organization; mapping, charting, and geodesy (MC&G) products, related requirements, and priorities; DMA's production programs and operations; and our request for resources in fiscal year 1983.

MISSION

Briefly, DMA's mission is to provide the Armed Forces the maps, charts, and geodetic products, data, and services that are essential to military operations and planning, including safe and accurate land, sea, and air navigation; and to provide other products that become an integral part of strategic and tactical weapons systems and are vital to their effectiveness. DMA also has a statutory responsibility to provide nautical charts and marine navigation data for the use of all vessels of the United States and of navigators generally.

MAJOR OBJECTIVES

DMA strives to provide timely support of the validated, global needs of the Armed Forces for MC&G products, data, and services by pursuing our major objectives which are to:

-- Meet the minimum, validated requirements of the military users for MC&G products; assure the availability of current products required for safety of flight and navigation at sea; and meet, to the extent resources and source materials permit, the need for completion of products and data required by the initial operating capability dates established for new weapons, navigation systems, etc.

-- Achieve production in the most economically feasible manner including a proper balance between in-house and contractual effort.

-- Continue to work closely with the military users to assure that currently available products are used where applicable before the production of a new product is undertaken or, if a new product is required, to produce the most economical product that will satisfy the requirement.

-- Plan the development of new production procedures, including innovative automatic data processing techniques, to meet the requirements for digital production.

-- Continue efforts to increase productivity through research and development, equipment acquisition, and improved production processes to better meet digital and other requirements for products.

-- Reduce the current backlog of products requiring maintenance to an acceptable level.

-- Continue working closely with the approximately 80 foreign countries with which we have cooperative agreements and with U.S. civil mapping agencies in order to maximize our ability to use, whenever possible, their products in lieu of direct production to meet military requirements.

SPECIAL PROGRAM OFFICE FOR EXPLOITATION MODERNIZATION

Since you were last briefed on the structure of DMA, the need has developed to expedite our efforts toward achieving an all digital production effort. Accordingly, I have established an Exploitation Modernization Program and placed it in a Special Program Office (SPO) which reports directly to me. The SPO's mission is to develop a pilot digital exploitation system and, where possible, to integrate its constituent parts, as they are developed, into our current production system. Within the next 18 months, we will have completed the major logistical and organizational changes and resolved the basic concept, system, and product specification issues for the program. Progress of the Exploitation Modernization Program will be reviewed internally by a committee made up of DMA senior staff members and by a board of outside experts in this field.

PRODUCTS AND PRIORITIES

Production continues to be limited to those products critical to near term military requirements. Priority is given to support of the strategic and theater nuclear forces, including the various cruise missile programs and PERSHING II, and to support of NATO forces and the Rapid Deployment Joint Task Force (RDJTF). At the same time, essential support to safety of flight and navigation at sea must be provided. The need to support production requirements in these categories leaves little capacity available for other requirements which generally have been deferred, considering levels of prudent risk.

REQUIREMENTS

The Military Departments and the Unified and Specified Commands annually identify and update their requirements for products and services according to priorities established by the Joint Chiefs of Staff. DMA reviews and validates those requirements against operational plans for weapons systems and force deployments. We also work closely with the users on a continuing basis in an effort to satisfy new requirements by modifying existing products or by investigating other ways of meeting requirements economically. After the requirements have been reviewed and refined with the using Commands and Military Departments, the results are then reviewed by the Under Secretary of Defense for Policy.

PRODUCTION PROGRAMS AND OPERATIONS

Following the requirements validation process, planned production programs are updated and appropriate guidance is issued to the production centers reflecting types of products to be produced, by priority in specific geographic areas, for integration into their detailed production programs.

- Accuracy and Currency of Products -

The production job would be easier and less costly if it were simply a matter of the one-time development of a given product for a specific purpose in a particular geographic area. However, it is not that simple because Defense operations are dependent on greater accuracies for geographic positions and elevations worldwide and man is constantly changing the earth's cultural features. Consequently, much of our production effort must be directed toward maintaining and increasing the accuracy and currency of our products. This also encompasses the immediate issuance of correction notices to users, when new information critical to safe navigation is received, and the revision, recompilation, printing, and distribution of corrected products. In addition, new and improved operational weapons systems with increased accuracies, faster speeds, longer ranges, better penetration capabilities, and more sophisticated guidance systems have required changes and improvements in MC&G data commensurate with the advances in hardware technologies.

- Digital Data -

As a result, the use of digital data has increased and, increasingly, our products are used directly by computers in new weapons systems and simulators. This imposes strict constraints on the data we produce. Products that are used in systems such as the cruise missile must be produced to close tolerances which leave little room for compromise with MC&G accuracies. The digital data to meet these requirements are produced by highly skilled technicians using complex, state-of-the-art stereocompilation equipment, supported by a large volume data processing capability. The trend toward increased use of digital data has not been accompanied by a compensating reduction in the requirements to support general purpose forces with conventional products. In fact, the need for products to support contingencies in some of the more remote areas of the world has become more urgent.

MAJOR PRODUCTION EFFORTS

DMA provides a wide range of MC&G products, data, and services to our military users. Frequently, a product can serve more than one purpose or a product that already exists can be modified to satisfy another need. However, our products usually must be custom made for the particular weapon system or other use for which it is intended. For example, terrain elevation data is a component of many of our map products and, in its digitized form, is an essential ingredient of many weapon systems; but the density requirements and geographic coverage vary greatly. Among the current major production efforts, most of which involve digital data, are the following:

- Manned Bomber and Ballistic Missile Support -

The largest segment of the DMA production effort in fiscal year 1983 is dedicated to strategic systems including all elements of the TRIAD. The support to manned bombers includes providing target positioning data, related offset aiming and radar fix points, digital terrain elevation data, feature analysis data, air target materials, ials, and various navigation and planning charts. DMA is supporting land and off-shore gravity data acquisition efforts for testing and operational deployment of the TRIDENT II. Support includes Earth Gravity Model (EGM) development, Launch Region Gravity Model (LRGM) development, and improved target positioning. The major effort during fiscal year 1983 will be in the development of the LRGM in the southeastern United States/Bahamas area requiring the establishment of approximately 30,000 gravity stations. DMA is supporting M-X tests with precise geodetic surveys and the development of an LRGM in the Vandenberg AFB area. Additional gravity acquisition efforts will depend on the final deployment decision.

- Cruise Missiles -

A variety of digital products are produced in support of the nuclear versions of the air, sea, and ground launched cruise missiles. In fiscal year 1983, we plan to hire 300 people and purchase additional photogrammetric equipment in support of the conventional cruise missile requirements which differ somewhat from those of the nuclear version. Although the conventional cruise missile also will require Terrain Contour Matching (TERCOM) matrices and Digital Terrain Elevation Data (DTED), the products will cover different areas than those for the nuclear version. Furthermore, Point Positioning Data Bases (PPDBs) will be required when the Digital Scene Matching System (DSMAC), an optical/digital correlator, is to be used so that the DSMAC scenes can be accurately controlled and related to the target. This requirement applies only to the conventional version.

- Rapid Deployment Force -

Subsequent to the establishment of the Rapid Deployment Joint Task Force (RDJTF) in early 1980, MC&G requirements were identified and refined. They focus principally on the Persian Gulf area and those remaining to be produced by DMA consist of some 3,400 map and chart products, approximately 1.3 million square nautical miles of PPDBs, and 98 terrain analysis data bases at a scale of 1:250,000.

- PERSHING II -

DMA's support to this land based tactical missile involves the production of PPDBs for in-field targeting, DTED, and Digital Feature Analysis Data (DFAD), the latter two for in-field generation of reference scenes on the missile systems' Reference Scene Generation Facility. The terminal guidance system of this missile uses correlation techniques to compare data from a plan positioning indicator antenna with stored digital reference scenes of the target area to correct the missiles' trajectory.

JUSTIFICATION OF RESOURCES

DMA resources are allocated with the goal of meeting the MC&G portion of all major national security objectives. Thus, within the constraints of available resources and the broad range of demands for MC&G support, priority is given to balancing the support of strategic systems with the needs of the tactical/mobility forces and the necessity for meeting safety of flight, marine navigation, operational and contingency planning, and training requirements of U.S. forces throughout the world.

The various appropriations by which DMA is funded complement one another in meeting our goal of satisfying validated DoD MC&G requirements effectively and economically. Accordingly, in the following paragraphs appropriations are discussed in the chronological order in which they normally make their contribution to MC&G production; that is, research and development, equipment procurement, and operations. Detailed information is contained in our justification materials; therefore, only the more significant changes are discussed here.

- Summary -

DMA's request for fiscal year 1983 is a significant increase over fiscal year 1982 which is primarily related to classified activities.

- Research, Development, Test and Evaluation (RDT&E) -

In previous years, DMA's request related only to the continuing research and development efforts financed by the Agency. This year, our request is divided into three separate segments. One is the Agency's continuing research and development program; the second is a new effort called the Exploitation Modernization Program; and the third is our acquisition development effort which, in previous years, was contained in the Air Force program. Details for these latter two efforts are classified.

The objectives of the DMA RDT&E program are basically twofold; first, to increase MC&G productivity with the implementation of expanding digital capabilities in the DMA mapping production system; and second, to develop new capabilities to make new products. The achievement of these objectives is critical to DMA's ability to satisfy increasing and more stringent MC&G requirements in support of DoD weapons systems such as the cruise missile, TRIDENT, and PERSHING II.

Of the total FY 1983 request, $27.9 million is required for our continuing RDT&E advanced and engineering development programs. The balance is for the Exploitation Modernization Program and our Acquisition Systems Development efforts.

For the continuing RDT&E program, the total FY 1983 request will be applied to six major RDT&E project areas:

-- $7.2 million for data collection which concentrates on collection of basic source data necessary to increase the accuracy, density, and area coverage of geodetic, geophysical, and bathymetric data.

-- $8.2 million for photogrammetric exploitation which addresses varied MC&G products and data unique to the specific weapon and command and control systems through the development of prototype equipment, techniques, and software that support the automated functions of cartography.

-- $5.9 million for cartographic exploitation which addresses varied MC&G products and data unique to the specific weapon and command and control systems through the development of prototype equipment, techniques, and software that support the automated functions of cartography.

-- $2.8 million for geodetic and geophysical (G&G) support which involves development efforts to exploit G&G data from satellite technology to improve the accuracy required to support advanced tactical and strategic weapon systems.

-- $3.1 million for data base/data bank technology which deals with the development of new methods for managing, structuring, formatting, storing, and retrieving the high volume of source data required for universal application.

-- $700 thousand for special products and services which involves sensor simulator inputs and new methods and techniques to portray MC&G data.

- Procurement -

In providing MC&G support that is responsive to evolutionary changes in military concepts, requirements, and priorities, DMA must exploit modern production technology by utilizing a wide variety of scientific and technical equipment. The orderly and timely procurement of such equipment is of vital importance to the accomplishment of the DMA mission.

DMA's Procurement appropriation request for fiscal year 1983 is $26.8 million which is an increase of $18.7 million over the fiscal year 1982 amount of $8.2 million. Of this increase, $9.4 million is for the purchase of additional technologically advanced photogrammetric equipment needed to meet production schedules for the conventional cruise missile. This will permit DMA to meet these new requirements while continuing to meet the similar but separate requirements of the nuclear cruise missiles. A primary thrust of DMA procurements is automation to alleviate labor intensive functions. The fiscal year 1983 request includes $1.6 million for the purchase of a second Clustered Cartographic Processing System (CCPS) and $2.8 million for the Computer Assisted Photographic Interpretation (CAPI) System which will rapidly extract, process, and edit digital data and significantly reduce our production pipeline time. The balance of the increase of $4.9 million is primarily for a classified program previously financed by the Air Force.

- Operation and Maintenance -

This appropriation finances the civilian manpower and other costs associated with the production, storage, and distribution of MC&G products and the operation and maintenance of DMA facilities.

DMA operating costs for fiscal year 1983 will amount to $371.3 million, an increase of $45.4 million over fiscal year 1982. Of this amount, $20.5 million is due to the effects of inflation ($7.3 million) and statutory pay entitlements of civilian employees ($13.2 million). Within the remaining $24.9 million, major programmatic increases are summarized as follows:

-- $3.0 million and 138 workyears which will enable DMA to support the most urgent requirements of the conventional cruise missile while continuing all essential support of the nuclear versions;

-- $2.5 million for training and start-up costs to operate a classified project;

-- $1.3 million for contract production of digital terrain elevation data for the FIREFINDER, a radar system for accurately determining the location of enemy artillery and mortar placements;

-- $3.9 million for the upgrade of DMA central site scientific and technical computer systems, together with the optimization and standardization of related software programs, which is essential to DMA's capability to effectively and efficiently accomplish increasing digital workloads and to support an expanding array of production support systems with embedded computers.

-- $6.0 million resulting from the decision that user charges for National Ocean Survey products will be increased over three years to recover the full cost of producing them. DMA's costs of purchasing domestic flight information publications, aeronautical charts, and nautical charts will increase accordingly. The fiscal year 1983 estimate reflects the first year's additional cost; and,

-- $3.8 million will provide for the acquisition of land and nearshore gravity data by commercial contract to meet the Navy's requirement for completion of the initial test areas for the Submarine Launched Ballistic Missile.

SUMMARY

In summary, Mr. Chairman, the fiscal year 1983 budget request will enable DMA to meet the most urgent and higher priority MC&G requirements of the Armed Forces.

Thank you, Mr. Chairman.

BIOGRAPHICAL SUMMARY

MAJOR GENERAL RICHARD M. WELLS

DIRECTOR

DEFENSE MAPPING AGENCY

Major General Richard M. Wells is the Director, Defense Mapping Agency, Washington, D.C.

General Wells was born in Washington, D.C. on 28 November 1929. He graduated from the U. S. Military Academy in 1951. He has a Masters Degree in Civil Engineering from State College of Iowa and a Masters Degree in International Relations from George Washington University. General Wells is also a graduate of the Naval War College and the National War College.

His assignments include Commander, 84th Engineer Battalion, Vietnam, August 1967-August 1970; Chief, Strategic Mobility Readiness Team, Office Vice Chief of Staff, U. S. Army, September 1970-July 1971; District Engineer North Central Division, Chicago, Illinois, August 1971-July 1973; Chief, Engineer Branch, Army Military Personnel Center, Alexandria, Virginia, August 1973-June 1974; Commander, 4th Advanced Individual Training Brigade, Fort Leonard Wood, Missouri, July 1974-June 1976; Division Engineer, Saudi Arabia, June 1976-July 1978; Division Engineer, North Pacific, Portland, Oregon, July 1978-July 1981; General Wells became Director of the Defense Mapping Agency in July 1981.

Decorations: Distinguished Service Medal
Legion of Merit (with Oak Leaf Cluster)
Bronze Star Medal
Air Medals

General Wells was promoted to major general 1 March 1981 with date of rank 1 August 1977.

DEFENSE NUCLEAR AGENCY

PREPARED STATEMENT OF LT. GEN. HARRY A. GRIFFITH, USA

DIRECTOR

Mr. Chairman and Members of the Committee:

I am Lieutenant General Harry Griffith, Director of the Defense Nuclear Agency (DNA). I am happy to testify today on behalf of the Agency's Fiscal Year 1983 budget request. I will review for you DNA's missions and summarize our total budget request. Then I will highlight our recent accomplishments and planned activities for the coming year in the areas of (1) research, development, test and evaluation (RDT&E); (2) operation and maintenance (O&M); and (3) procurement (P,DA).

DNA'S MISSIONS

The Defense Nuclear Agency is responsible within the Department of Defense (DoD) for a wide range of functions related to nuclear weapons. In particular, DNA is the principal agency within the DoD for research, development and testing in the area of nuclear weapons effects. We develop weapons effects simulators and conduct all underground nuclear weapons effects tests for the DoD. In carrying out this broad mission, DNA maintains close liaison with each of the military services, other Federal agencies and the Office of the Secretary of Defense (OSD) to ensure that our research meets both present and projected weapon system requirements and intelligence needs. We are, of course, at the service of the Congress and the Executive Branch as well.

DNA's RDT&E programs provide data on the effectiveness of nuclear weapons (ours and those of potential enemies); nuclear vulnerability and hardening information for systems, forces, and critical military targets; methodology for nuclear weapons targeting; improvements in the survivability of our theater nuclear forces; research into physical security of nuclear weapons; and biomedical data on nuclear weapons effects.

In the area of operations and support, DNA performs numerous functions related to nuclear weapons; we inspect nuclear-capable units of all Services; formulate nuclear weapons accident procedures and training doctrine as well as conduct major exercises; provide support to comprehensive test ban negotiations; take the lead in developing a DoD Overseas Nuclear Emergency Search Team (ONEST) capability; administer the facilities on Johnston Atoll, and together with the Department of Energy (DoE), oversee the national atmospheric nuclear test readiness program under the Limited Test Ban Treaty; manage the US nuclear weapons stockpile; coordinate with Military Departments in establishing nuclear weapons safety rules; and carry out numerous other activities related to nuclear weapons.

Finally, DNA's role in nuclear weapon security and counternuclear terrorism crosses both operational and RDT&E areas. We assist in assuring that the physical security, intelligence, and special operations communities integrate their effort in protection of US nuclear weapons worldwide. DNA manages the exploratory development of DoD physical security systems to assist in integration of the overall DoD physical security RDT&E program.

Some of the exploratory development is devoted to supporting counterterrorism RDT&E projects. Operational support of specified national counterterrorism programs includes establishment of this nation's overseas NEST program and maintenance of continuous capability to conduct an emergency US nuclear stockpile verification. DNA provides nuclear effects input to the Federal Emergency Management Agency (FEMA) and maintains a close technical exchange relationship with DOE and Nuclear Regulatory Commission (NRC). DNA is the proponent for DOD nuclear weapon security criteria.

SUMMARY OF DNA'S BUDGET

The Defense Nuclear Agency's budget request for FY 1983 is $370,591,000 as shown in Table I.

TABLE I
Defense Nuclear Agency Budget
(Dollars in Thousands)

Appropriation	FY 1981	FY 1982	FY 1983
Research, Development, Test and Evaluation	199,771	259,757	326,600
Operation and Maintenance	30,663	33,584	41,419
Procurement	1,605	1,903	2,372
Military Construction	--	500	200
Total DNA	232,039	295,744	370,591

For FY 1983, RDT&E accounts for 88 percent of the total budget request; O&M for 11 percent, and Procurement and Military Construction for one percent.

RESEARCH, DEVELOPMENT, TEST & EVALUATION

I will first present the research we are pursuing in support of our strategic systems. Then I will review the programs to improve the survivability and endurance of command, control, communications and intelligence (C^3I) systems. Next, I will discuss our evolving program supporting theater nuclear forces, followed by our physical security program and then I will outline our test programs for improving and validating the nuclear survivability of military systems. This latter summary will include both underground nuclear testing and the use of aboveground simulators. Finally, I will discuss our research in biomedical effects, including our Nuclear Test Personnel Review (NTPR) program for developing information on personnel exposure to ionizing radiation in past atmospheric nuclear tests.

Strategic Systems

Our RDT&E program in nuclear weapons effects addresses all elements of the strategic TRIAD: Intercontinental Ballistic Missiles (ICBM's), aircraft, and the Sea Launched Ballistic Missiles (SLBM's). This program is closely coordinated with all Services and the Under Secretary of Defense for Research and Engineering (USDRE). We also support the Under Secretary of Defense for Policy (USD/P), the Joint Strategic Target Planning Staff (JSTPS), Strategic Air Command (SAC) and the intelligence community in the exploitation of weapons effects for targeting. DNA is continuing to provide substantial support to the Air Force in development of strategic weapon systems. We remain a key player in the development of nuclear weapons effects survivability data for long term basing of the M-X system. Our nuclear hardening and survivability program, conducted in close coordination with the Air Force, contributes directly to the design and validation testing of the missile, protective shelter, and supporting command, control, and communications (C^3). We also support advanced research directly applicable to Intercontinental Ballistic Missiles (ICBM) site security. I want to emphasize that in this area especially, the focus of our research program remains on long term basing survivability issues. The potential for super hard silos and deep underground basing recognized in the President's ICBM modernization program are both predicated on continuing DNA research in these areas.

DNA was tasked directly by the Secretary of Defense to work with the Air Force on critical missile survivability issues for a deep underground (DUG) basing system for ICBM's as related to a secure reserve force. These issues concern the siting requirements, understanding and predicting of ground shock propagation through the earth, the survivability of tunnels at depth, communications, and egress. We are also supporting the Air Force on the other candidate options for long term basing of M-X. In this context, we have reoriented our M-X Electromagnetic Pulse (EMP) program to identify more general EMP survivability issues. We are proceeding with the development of a source region EMP (SREMP) simulator that will be generally applicable for testing

M-X (as well as potential Ballistic Missile Defense (BMD)) land based configuration to the electrical effects generated from close-in nuclear bursts.

Our program continues to support the Air Force in developing tools and techniques for hardening and validating the M-X missile to the in-flight and in-place nuclear effects environment. DNA has recently conducted the first experimental characterization of missile electromagnetic response at pressures corresponding to the 50-100 Km altitude flight segment. We have also recently concluded a series of live test firings of small rocket motors. Through this experiment we have been able to demonstrate that the rocket motor is an important consideration in EMP hardening design. An underground nuclear test, HURON LANDING, is planned for September 1982 to investigate the adequacy of the present design.

Additional M-X hardness validation technical challenges are the scale of the simulators (nothing comparable presently exits) and the complexity of the nuclear environments resulting from the many closely timed and regularly spaced bursts (i.e., multiburst environment) presumed in the threat scenario. DNA presently is initiating a program to develop electrical surge arrestor technology for mitigation of an extremely severe electromagnetic threat to hardened facilities (such as M-X), viz, the huge current surges induced on long power and command, control, and communications (C^3) lines from near by surface detonations. This effort will produce prototypes of devices directly applicable for use in M-X and many other facility hardening applications.

DNA has recently reoriented its Low Altitude Defense System (LoADS) program to address Ballistic Missile Defense (BMD) options for survivability ICBM basing concepts. Under our continuing joint program with the Army Ballistic Missile Defense Command we are defining the electromagnetic pulse (EMP) threat in terms of voltages and currents on system elements, and providing engineering guidelines for hardening the system to that EMP threat. We are investigating several underground nuclear test options to obtain important data on the severe electromagnetic stresses and to validate selected hardening design features. The underground test options would be part of a jointly formulated hardness validation plan that will specify test and analysis activities required to certify the system's ability to operate in a threat level EMP environment. We are also supporting advanced ballistic missile defense (BMD) concepts by improving our ability to predict nuclear weapons effects on radar and infrared systems.

In the area of strategic aircraft systems, we are assisting the Air Force in assessing the blast and thermal hardness of the B-52, B-1, and the air-launched cruise missile (ALCM). We are developing thermal hardening schemes such as thermal canopies and blast sensors for crew protection and blast damage avoidance. Our development of thermal simulators for testing and improvement of theoretical computational techniques will also contribute directly to aircraft thermal hardening. Another part of the strategic systems program is concerned with vulnerability to electromagnetic pulse (EMP) effects. We are making substantial progress in developing a methodology to assess the vulnerability of existing unhardened aircraft to EMP. We have completed tests of the F-16 and A-7E. F-14A tests are ongoing. This joint program with the Air Force and Navy will have immediate application to the Air Force Strategic Aircraft Protection Program to be initiated in late FY 82 on the FB-111A. In addition, we are working with the Services and other DoD agencies to develop a set of comprehensive EMP hardening design guidelines and verification protocols for all strategic systems, in particular strategic aircraft. This long range multi-agency technology program will develop the techniques for EMP hardening our strategic systems.

DNA is continuing its efforts with the Navy to improve the survivability of U.S. submarines to underwater nuclear explosions. We have developed new methods for predicting shock pressure loadings on submarine hulls, replacing mostly empirical procedures, and are now better able to protect critical internal equipments. The successful transfer of this technology to participating Navy laboratories and the incorporation of improved shock resistance techniques into Navy submarine design procedures are significant accomplishments. Other aspects of underwater explosion phenomenology on which we will be working relate to the generation of water waves, shock environments in shallow water, and cavitation loading effects on surface ships. Portions of this program are done in cooperation with the United Kingdom.

An area of great interest is the acoustic reverberations (referred to as BLUEOUT) resulting from nuclear detonations in deep ocean basins.

In cooperation with the intelligence community, DNA is conducting several important programs to provide techniques and the nuclear weapon effects data base for use by the intelligence community in the evaluation of the physical and functional vulnerability of Soviet strategic targets. Our recent analytical and experimental results have had a direct impact. We have assisted the Navy and have provided the Defense Intelligence Agency with a new computerized method. This continuing program will focus on the failure level testing of generic hard target structures under combined nuclear effects, and the development of improved vulnerability assessment techniques. Methods for evaluating the vulnerability, taking into account the critical elements, also have been developed.

In support of the Office of the Secretary of Defense, the Joint Chiefs of Staff and the Strategic Air Command, DNA is involved in research activities related to strategic nuclear weapon employment as a basis for implementation of national strategic targeting policy. To provide increased flexibility in nuclear weapon employment options, we are examining alternative uses of strategic nuclear forces against various aspects of the Soviet military force structure, political, governmental, and economic installations. Automated procedures are being developed for the Joint Strategic Target Planning Staff and the nuclear force commanders to implement these alternate targeting strategies. Our research is also placing substantial emphasis on the implication of protracted nuclear war in support of guidance contained in PD-59, NSDD 13, the Policy Guidance for Employment of Nuclear Weapons, and continuity of government issues. To support the military community during operations in a protracted war environment, we are conducting research into the feasibility of packaging of a small, highly powerful easily transportable computer system to facilitate war planning.

C^3I Systems

I will now discuss our program on survivability and endurance of command, control, communications and intelligence (C^3I) systems. For the most part, this activity directly supports our strategic activities; a lesser, but growing, effort related to our theater nuclear force program will be covered subsequently.

There is widespread recognition of the need to enhance the survivability, endurance, and reliability of C^3I systems to meet the needs of the National Command Authorities (NCA), as well as individual commanders, during all stages of nuclear conflict. DNA's program is intended to provide the technology and data base necessary for C^3I planners to meet these goals; that is, to ensure that systems (a) are designed to mitigate damage from nearby nuclear explosions, (b) are not subject to single-point vulnerabilities, and (c) are not degraded as a result of the long-range effects of electromagnetic pulse (EMP) and propagation disturbances. We have also provided the nuclear weapons effects inputs in recent high level panels addressing the crucial issue of enduring C^3I, and we actively support the recently established Joint Strategic Connectivity Staff in its efforts to assess strategic connectivity under nuclear attack.

Satellites are among the most critical of our communication assets and of growing importance to the national defense.

In the absence of atmospheric testing, we must rely on theoretical calculations supported by experimental simulations in the laboratory and naturally occurring or man-made disturbances in the ionosphere to gain a deeper understanding of electromagnetic wave propagation effects. We are developing simulator techniques for testing satellite system response to the communications link disturbances that would be caused by high altitude nuclear weapons bursts. The ionizations resulting from high altitude detonations can cause scintillations (phase or amplitude changes) in the signal propagating to or from a satellite. A limited capability simulator was used to test selected strategic communications systems components in 1981, and a full capability simulator will be used on the Integrated Operational Nuclear Detection System (IONDS) in 1982. These nuclear effects simulators are in two to three 19 inch cabinets and will permit the laboratory evaluation of the effectiveness of various scintillation-mitigation techniques and the operation of the system in a nuclear-environment. As a new initiative, a laboratory program is being planned to investigate plasma formation immediately after detonation of a high altitude burst. This early-time plasma behavior is important because it sets the initial conditions for the long lasting communication disturbances. We are implementing an experimental program utilizing the naturally occurring disturbances (aurora, solar storms) in the polar regions. These data will be used to further reduce propagation disturbance uncertainties.

The DNA C^3I program is aimed at improving the understanding of these effects as well as providing the experimental capability to demonstrate hardening techniques. Present radiation simulators such as the AURORA facility at Harry Diamond Laboratories, White Oak, Maryland, are being used to investigate transient radiation effects on electronics. We continue to rely on underground nuclear testing for exposure of satellite sized objects. We are examining the possibility of exposing the SGEMP Test and Research Satellite (STARSAT), a full scale experimental satellite model based on the DSCS III communications satellite design, on the MIDAS MYTH underground nuclear test. This technique will be used. Because of the limitations of our current above ground simulation capability and the expense and infrequency of underground tests, we are examining alternatives for enhancing our laboratory research capability. I will touch on this again in a few moments.

Many of the DoD's communication needs within the continental United States are currently supplied through leased commercial telephone service.

In response to the Under Secretary of Defense for Policy (USD/P) and the Under Secretary of Defense for Research and Engineering, direction on enduring command, control, and communication (C^3) and strategic connectivity, we are evaluating alternative systems that may satisfy time-urgent DoD strategic command and control requirements in a manner that is more cost effective and maintainable. DNA has been assisting DoD planners in developing technology, program plans, and cost estimates for providing EMP protection to a small portion of these systems.

DNA is assisting SAC in the concept development of a stand alone planning facility. The facility is required to be survivable through proliferation and capable of providing the decision maker with information upon which to base force commitments. DNA is developing the concept with two parallel efforts.

I must stress, however, that time-urgent DoD requirements represent only a small portion of communication needs for continuity of government in the trans-and immediate post-attack period. This has been forcefully recognized, and is an area, I believe, in which DNA is being particularly responsive to national needs. To support national goals, DNA is investigating the feasibility of developing low cost EMP protection concepts that can be applied to all elements of the national telecommunications systems, and will develop engineering maintenance practices necessary to implement and maintain this protection.

DNA has established a new technology data base program on nuclear effects on electronics, combining existing research efforts on transient radiation effects on electronics (TREE) with related electromagnetic pulse (EMP) and system generated electromagnetic pulse (SGEMP) activities. The dramatic advances in microelectronics--improvements in signal processing capability, weight and volume reduction, and decreased power consumption--are making military applications increasingly dependent upon this technology. This trend in microminiaturization has, on the other hand, increased component sensitivity to both natural and nuclear radiation. DNA has demonstrated this single event degradation and is investigating the extent of this problem in a joint program with DARPA. In addition, we are emphasizing the development of hardening technology at the major semiconductor manufacturers to facilitate the availability of hardened parts of military systems designers. An important aspect of this is our support to the new DoD Very High-Speed Integrated Circuits (VHSIC) program in the development of hardening procedures within the VHSIC contractor community.

DNA has a number of efforts to enhance the survivability and endurance of Theater Force C^3 assets. DNA will assist U.S. Army V Corps in a three-phase proof of principle test in Europe. USAREUR and the Army's Training and Doctrine Command, Combined Arms Combat Development Agency, and Army Communicative Technology Office support the evaluation which complements DNA programs to improve the survivability and security of the command and control headquarters of our theater nuclear forces.

The use of a theater nuclear force command, control, and communications (TNFC^3) architectural scheme has the potential for good performance in all but the most severe nuclear environments. DNA is supporting the design by developing a propagation prediction capability that is compatible with the environment in which the system will be used, i.e., Europe. The existing predictive capability is not based on data from propagation measurements in Europe.

Theater Nuclear Warfare

It was reported to the Committee last year that theater nuclear commanders have enthusiastically received the results of our research efforts in the areas of nuclear weapon employment, deployment and modernization. This program initially focused on NATO and U.S. nuclear forces in Central Europe. Subsequently, the DNA program has considered other theaters where the spectre of nuclear warfare has been reinforced by Soviet and surrogate force belligerence; specifically, Western Pacific, Southwest Asia, and the worldwide maritime theater. With respect to European theater nuclear forces, our comprehensive assessments of the nuclear balance continue to provide valuable inputs to the defense force posture planning community.

In continuing our support to U.S. and NATO theater nuclear warfare planners, we have recognized the need to develop automated nuclear weapon planning tools and procedures. DNA has developed the Target Analysis and Planning (TAP) System to demonstrate a capability to locate (by use of existing target acquisition capabilities), identify, and recommend movable targets for attack with nuclear weapons in near-real time. TAP development is in response to the request of USEUCOM and OSD direction to determine what would be necessary to hold Warsaw Pact Second Echelon divisions at risk. The problems inherent in timely and accurate weapon delivery against such targets demand as near-real time targeting capability. These targeting tools must be able to deal with a range of battlefield situations--from enemy units in contact with friendly forces, to enemy units in the second echelon moving forward from rear assembly areas. Hardware and software are presently being evaluated at the U.S. Army V and VII Corps Headquarters in Europe. The application of the emerging microcomputer technology is providing a new capability to meet this demand. The DNA research has automated the capability of field units to plan the near-real time employment of nuclear weapons. These tools and procedures have resulted in drastic reductions in planning time when tested in field exercises. In addition, mainframe computer codes have made possible the improved application of theater nuclear weapons against a variety of fixed targets, the destruction of which will further degrade, delay, or disrupt the Warsaw Pact forces.

A key issue before the nation and the Congress is modernization of our theater nuclear forces. DNA's force development activities complement activities among the Services to ensure that doctrine, tactics, and weapons are optimally designed and deployed to meet the threat. For example, we are completing assessments of PERSHING II worldwide mission capability and cruise missile inflight survivability. These force modernization assessments are coupled with the arms control research efforts that DNA has instituted recently.

While we continue our European programs, we are also expanding a major net assessment of the Pacific Command's theater nuclear balance, which was begun last year at the request of the CINCPAC through the Joint Chiefs of Staff. PACOM includes a vast area, encompassing over one-half of the earth's surface and 70 percent of its ocean waters. Over the next few years, we will be supporting programs to address nuclear force posture options, improved nuclear weapon planning capabilities, and alternate nuclear doctrines. This initial effort in support of the Pacific Command has already contributed significantly to developing theater nuclear deterrence posture and world stability.

Let me turn now to our Theater Nuclear Force Survivability, Security and Safety (TNFS^3) Program, an activity closely aligned with our theater improvement efforts. The TNFS^3 Program was initiated in 1978 and expanded in 1980 to encompass the broadest possible spectrum of survivability, security and safety issues affecting our theater nuclear forces--survivability from all enemy attack options; security from unauthorized seizures--all without degradation of safety or operational effectiveness. The TNFS^3 security initiatives impact the U.S. nuclear weapon program worldwide and, therefore, interact closely with our physical security program. I will address these common initiatives further when I review the physical security program.

The TNFS^3 program examines every facet of the force-delivery systems, logistics, storage sites, communications, and nuclear weapons--in order to reduce the vulnerabilities of our theater nuclear forces. Major efforts are underway to improve the survivability of air-delivered nuclear weapons. Testing has begun on a totally new concept for storing weapons in secure vaults inside aircraft shelters. A prototype vault has been tested in conjunction with a full-scale explosive test of third-generation hardened aircraft shelters and will also be further tested in Europe. These two projects have the potential for enormously improving not only survivability but also the security and safety of Air Force theater weapons. Other recent accomplishments include assessing the survivability of the Ground Launched Cruise Missile (GLCM), developing improved means of protection of nuclear weapons during transportation and storage, planning for the integrated rapid dispersal of nuclear weapons, and investigating signature reduction concepts for deployed missile systems.

It is very important to note that all the TNFS^3 projects have been planned and developed in cooperation with the Services and the theater commands. This close-working has been a key factor in the success of the TNFS^3 Program to date.

At the direction of the Under Secretary of Defense for Research and Engineering (USDRE), DNA manages the DoD exploratory development program for physical security, which is coordinated closely with the TNFS^3 program. DNA emphasizes the system aspect of security and provides the Services with resources for enhancing the performance of their security forces as well as hardware, facilities, and doctrine. The agency is currently pursuing a project that develops objective measures for security guard performance, measures the effectiveness of the security guard -- electronic security system interface, establishes a basis to provide performance feedback and identifies weaknesses in system design and operation. Further, DNA will be building a DoD simulated nuclear security operational test site at Fort McClellan, Alabama. This site will support test and evaluation and doctrinal development of security systems designed to protect nuclear weapons.

An example of physical security hardware development is the weapons access denial system (WADS). In 1974, DNA and the Sandia National Laboratories (SNL) began exploration of concepts to place automated devices inside storage structures to deter and delay forced entry. DNA assisted the Army in packaging these deterrent-delay prototype modules for overseas demonstration and testing by US Army-Europe. Based on these tests and adversary tests conducted in CONUS the most promising components are being further developed for field use by the Army.

Other significant security programs include advanced design. Finally, the DNA physical security program provides support to those organizations having roles in counter nuclear terrorism and nuclear weapon recovery.

Test Programs

I turn now to DNA's testing activities. Many of our research programs involve experimentation arising from the need to simulate the radiation and blast effects produced by nuclear explosions and to determine the influence of these effects on the performance of military systems. The most significant and still indispensable aspect of our test capability is the underground testing program conducted at the Nevada Test Site (NTS). I am extremely pleased to report that our FY 1982 budget for underground testing will allow us to begin the revitalization of our UGT capability to meet important requirements and will permit us to initiate a needed facilities upgrade program at NTS. Major funding to complete this will be required in FY 1983 and 1984. These test requirements include system generated EMP phenomenology tests in support of M-X; and, potentially a major test of the M-X missile; the continued development of the Advanced Ballistic Reentry (ABRV); the Trident II, including the missile and reentry vehicle; advanced warhead designs; cratering physics tests; and the development of improved techniques for testing the X-ray response of military systems.

Our two next scheduled main events in the underground nuclear test program will be concurrently conducted in September--(1982)--HURON LANDING and DIAMOND ACE.

HURON LANDING, DNA's next horizontal line-of-sight test, has a scheduled readiness date of September 1982. The main objective of this test is to provide data. In addition, DNA is cooperating with the DoE in examining the effects of X-radiation. Approximately 400 separate experiments are being fielded and about 3000 channels of data will be recorded.

DIAMOND ACE, the first event in the DISTANT ARBOR series, will provide detailed diagnostic data of the radiation output of a low-yield nuclear device. This experiment is the first step in the development of a low-yield test bed capability which will provide faster turnaround, more cost effective test bed which can be tailored to user needs.

In addition to the actual fielding of underground nuclear tests, DNA is initiating an upgrade of the DoD facilities at the Nevada Test Site in cooperation with the DoE. Because of funding limitations, those facilities have been allowed to erode to an unacceptable condition. For example, over 75% of our instrumentation is more than 10 years old. Not only is the repair becoming difficult and increasingly expensive, but the majority of this equipment is not suited for the increasing sophistication of the underground experiments. The cable plant was installed in 1965 with an anticipated five-year life. At present less than half the cables are fully functional. The tunnel complexes have eroded to the point where only one complex is operational. This limits the number of working points and the turn around time between tests.

To reverse this trend, DNA is beginning to upgrade the facilities. The full upgrade will require about 2 1/2 years at a cost of about $30M. Specific items in the upgrade will include instrumentation modernization including digital recording systems and fiber optics transmission, restoration of the tunnel complexes, and the acquisition of modern mining equipment.

Our most recent event in the high-explosive testing program took place in September at White Sands Missile Range. Identified as MILL RACE, this test simulated the airblast effects from a one-kiloton nuclear surface burst. Recent advances in large-area thermal radiation simulation were utilized to test for combined airblast and thermal effects on selected experiments. All three Services, as well as the Federal Emergency Management Agency (FEMA) and several foreign countries fielded experiments on the MILL RACE test. These included model structures of the Low Altitude Defense (LoAD) radar and interceptor cannister to determine airblast loads, new Army designs for hardened tactical and mobile electronic shelters, a Navy program for new ship superstructure construction, and industrial hardening techniques developed by FEMA. The Strategic Air Command flew several B-52s as part of their damage assessment strike analysis program. Two AF-86 drones were flown through the blast region to measure loads on aircraft in flight.

DNA's next large scale high-explosive test, DIRECT COURSE, will be in September 1983. This event will simulate the airblast effects from a one-kiloton nuclear burst detonated at a height of over 100 feet. In support of this experiment, DNA is continuing the development of large thermal simulators. This will improve the capability of investigating the interaction of thermal and blast on military equipment.

An equally important part of our test program is the development of advanced laboratory radiation simulators. These simulators are necessary to increase our overall nuclear weapons effects testing capability.

At the direction of USDRE, we discontinued the development of the Satellite X-ray Test Facility (SXTF). SXTF was to be used to develop a better understanding of, and hardening technology for, system generated EMP (SGEMP) effects on satellites. DNA is now developing a cooperative SGEMP program with the Air Force. We are also examining alternatives for developing a laboratory research capability using the X-ray source developed for the SXTF. This effort will make maximum use of existing DNA facilities.

X-ray sources developed for SXTF are now being used to test components of satellites and missiles and to do X-ray effects research. We expect that a next-generation, very high power source will be operational in early 1985 which will provide the capability to test larger reentry vehicle and missile components. To attain the high X-ray out put ultimately required for full-system reentry vehicle testing, we are continuing to explore the potential of radiation amplification using inertial confinement fusion.

DNA is continuing to assist the Air Force in the development of simulators to examine the effects of source region electromagnetic pulse (SREMP) on the M-X system for the proposed basing modes. A late-time SREMP simulator capable of delivering up to 10 megajoules of electrical energy into the power lines and medium frequency antenna will be procured in FY 1982-83 and be available for field testing by FY 1984. DNA is also investigating the feasibility of a SREMP simulator for Army systems. As a part of this DNA-Army effort, the Army Meterological Data Set (MDS) is being tested at the AURORA simulator in FY 1982.

Our Advanced Research Electromagnetic Simulator (ARES) has the capability to test missiles, small-to-medium size aircraft, and cruise missiles to the effects of high-altitudes electromagnetic pulse. Tests of nearly all major missile systems such as SPRINT, SPARTAN, MINUTEMAN, POLARIS, and TRIDENT have been carried out in the ARES facility since 1971. Last year, full system tests of the United Kingdom A3TK POLARIS and TRIDENT C-4 missiles were completed. The ARES instrumentation system currently is being upgraded to support M-X missile testing beginning in January 1983.

Biomedical Effects

To this point, I have been describing DNA activities related to military hardware and systems. An essential element of our mission is the effects of nuclear weapons upon humans. More than 80 percent of the DoD research into the biomedical effects of ionizing radiation is conducted at our Armed Forces Radiobiology Research Institute (AFFRI) in Bethesda, Maryland. Methods of estimating the human response to various levels of radiation are being developed, verified and improved as we learn more about the response of cells, tissues, organs, and intact laboratory animals to different levels of radiation.

The biological research focuses mainly on ionizing radiation injury and covers three distinct, but related areas. First, we are defining the effect that ionizing radiation, either alone or in combination with other physical and mental stresses, has upon the ability of personnel to carry out operational missions. Second, we are determining how the deleterious effects are caused. Third, we are developing more effective ways to prevent the damage from occurring and to treat that which does occur. While progress is being made in each of these areas, many important questions remain to be answered.

DNA also has a small research effort to address the biological effects of air blast. The detonation of a nuclear weapon results in large pressure waves that have many different characteristics. The determination of the biological effect of these waves for operational situations is being investigated.

DNA, as the designated Executive Agent for DoD, is continuing the Nuclear Test Personnel Review (NTPR). This program, begun in 1978, is to identify all DoD-affiliated participants in the 1945-62 atmospheric nuclear tests, document their involvement, and establish their probable radiation exposures. With the support of the National Academy of Sciences, we are also conducting a survey of the health experience of a large sample--about 60,000--of the estimated 220,000 test participants. About two more years will be required for the health survey and publication of final radiation-health correlations.

OPERATION AND MAINTENANCE

DNA's Operation and Maintenance (O&M) funding requirements by program category are furnished in Table III below.

TABLE III
O&M Program
(Dollars in Thousands)

Program Category	FY 1981	FY 1982	FY 1983
Headquarters/Field Command Operations	13,723	14,986	17,330
Nuclear Stockpile Management	3,656	4,197	5,372
Johnston Atoll Operations	10,704	13,435	12,076
Nuc.Wpns Accident Training Exer.	2,165	365	2,740
Overseas Nuclear Emerg. Search Team	415	601	601
Atmospheric Release Advisory Capability	--	--	2,000
Plutonium Limits Analysis	--	--	1,300
Total O&M	30,663	33,584	41,419

Headquarters/Field Command Operations

This program category provides funds for daily operating expense at Headquarters DNA in Washington, D.C. and at Field Command in Albuquerque, New Mexico to support the following missions:

-- Management of Department of Defense (DoD) research and testing programs involving nuclear weapons effects by continuously evaluating DNA's RDT&E program to assure that it is in consonance with national policy and the needs of military systems, both existing and under development.

-- Provides the Secretary of Defense (SecDef), the Joint Chiefs of Staff (JCS), the Supreme Allied Commander Europe (SACEUR), and other high-level commanders with quantitative assessments of various strategic and theater nuclear employment strategies, policies and doctrines, and nuclear weapons implementation planning including the requirements for nuclear weapons.

-- Conducts research in nuclear weapons survivability and security, and furnishes sound management advice and assistance to the SecDef, the JCS, and the Services on all aspects of nuclear weapons safety, security, and survivability.

-- Manages the DoD nuclear weapons stockpile, consolidates nuclear stockpile data, and furnishes the SecDef, JCS, Military Services, and other users with timely, accurate, and complete nuclear weapons stockpile information.

-- Accomplishment of annual Defense Nuclear Surety Inspections on 20-25% of all Service nuclear-capable units.

-- DNA plans and maintains, in conjunction with the Department of Energy (DOE), a nuclear test readiness capability in accordance with Safeguard C of the 1963 Limited Test Ban Treaty, to include the operation and maintenance of Johnston Atoll.

-- Acts as executive agent for the Nuclear Test Personnel Review (NTPR) Program which addresses all matters pertaining to the participation of DoD personnel in the atmospheric nuclear weapons tests in 1945-62.

-- Acts as executive agent for the coordination of DoD support to the Department of Health, and Human Services in developing a uniform U.S. Government approach to the problems associated with exposures to all sources of ionizing radiation (Ionizing Radiation Health Effects (IRHE) Issues Coordination Program).

-- Assesses the impact of all aspects surrounding a Comprehensive Test Ban Treaty on the DoD and its mission.

-- Develops, coordinates, and conducts nuclear weapons accident exercises and other nuclear-related operations.

The increase in this program in Fiscal Year 1983 results from the programming of a new GAO approved accounting system, the 1 Oct 81 Civilian pay raise and other miscellaneous requirements.

Nuclear Stockpile Management

Resources included in this category support DNA's mission to provide consolidated management of all nuclear weapons in DoD's stockpile. This mission, worldwide in scope, requires DNA to maintain overall surveillance and provide guidance, coordination, advice or assistance, as appropriate for all nuclear weapons in DoD custody from completion of production by Department of Energy (DOE) through retirement. DNA, as the exclusive source of data for the complete stockpile, performs this function by maintaining and operating the national nuclear weapons accounting and reporting system. This system enables DNA to provide timely, accurate, and complete data on each weapon in the stockpile--including serial number, location, application, configuration, and condition--to assure that the status of all DoD nuclear weapons is known at all times.

The increases in this program are essentially due to entry of DNA into the Worldwide Military Command and Control Systems (WWMCCS) Community in December 1981 as a full member and Secretary of Defense tasking for DNA to consolidate control of nuclear weapons data for the Commander in Chiefs (CINCs) and Services.

Johnston Atoll Operations

DNA is charged, in conjuction with DoE, with maintaining an overseas atmospheric nuclear test capability--to include the operation and maintenance of Johnston Atoll--in accordance with the revised Presidential guidelines for Safeguard C of the Limited Test Ban Treaty. Actual operations and maintenance at Johnston Atoll are performed for DNA by a civilian contractor. Operations financed include normal base support functions, in addition to marine operations and other unique island requirements essential for life support at this remote facility in the Pacific.

The decrease in Fiscal Year 1983 is primarily due to a one time project to repair the runway on Johnston Atoll in Fiscal Year 1982. This decrease was partially off set by an increase in the cost of other miscellaneous contracts at Johnston Atoll.

Nuclear Weapon Accident Exercise (NUWAX)

DNA sponsors the Nuclear Weapon Accident Exercise (NUWAX) series for the Assistant to the Secretary of Defense for Atomic Energy. The purposes of these exercises, which involve primarily the Department of Defense, Department of Energy and the Federal Emergency Management Agency, are to increase the Federal government's capability to respond effectively to a nuclear weapon accident and to refine procedures for achieving maximum Federal-civil coordination at such an accident.

Each NUWAX is designed to exercise existing procedures and train Federal and civil agencies responding to a nuclear weapon accident in a realistic environment. They are conducted in a no-fault atmosphere in order to evaluate interagency relationships, not to evaluate the response of individual agencies.

The long-term goals of this program are to evaluate and test the many response and coordination procedures that have been developed to deal with a peacetime nuclear accident. A continuing series of biennial exercises is necessary to achieve these goals due to the extensive planning and coordination requirements for such a major undertaking. The US Navy is the lead Service for NUWAX-83, which will be conducted at the Nevada Test Site in the spring of 1983. This exercise will emphasize joint Federal-civil efforts to minimize the risk to the general public in the unlikely event that a nuclear weapon accident results in the dispersal of radioactive material.

The funding increase in FY 83 represents the difference between a planning year (FY 82) and an exercise year (FY 83).

Overseas Nuclear Emergency Search Team (ONEST)

The Secretary of Defense assigned DNA the responsibility for developing, establishing, and supporting an ONEST capability. This program was initiated in FY 1979. DNA will continue to monitor contract compliance; maintain essential liaison with DoD overseas activities; as well as direct contractor personnel in the deployment, personnel training, and equipment maintenance associated with this program.

Atmospheric Release Advisory Capability (ARAC)

This project is a key element in the technical direction of the DNA in the development of a planning criteria for response to nuclear weapon accident at a nuclear fixed facility. The objectives are to develop and/or expand capabilities for plotting and rapidly displaying accident effects tailored to site-specific topography, demography, and geography. Efforts will include development of site-specific survey reports on nuclear weapon storage sites for the purpose of integrating the Department of Energy's Atmospheric Release Advisory Capability (ARAC) into the overall plan. The total project enhances the health and safety of the general public in the event of an accident or incident involving the release of radiological contaminants on and near a DoD nuclear weapon fixed facility. This project supports all Department of Defense, FEMA, state, and local activities concerned with nuclear weapons effects during a nuclear weapons accident. Specifically, this project supports Service requirements for nuclear weapons effects information during a nuclear weapons accident.

Plutonium Limits (PU Limits)

This project will provide to the decision-making authority, relevant data and methodology to facilitate judgements concerning justifiable plutonium limits in all environments throughout the stockpile-to-target sequence. Additionally, this study will identify areas that require further research and testing. Finally, the analysis will identify and evaluate a series of candidate positive actions that can mitigate the hazard and reduce the overall risk to the public.

PROCUREMENT

The procurement funding requirements by program category are furnished in Table IV with two prior years for comparison.

TABLE IV
Procurement Program
(Dollars in Thousands)

	FY 1981	FY 1982	FY 1983
Vehicles	174	206	418
Other Capital Equipment	1431	1697	1954
TOTAL PROCUREMENT	1605	1903	2372

The DNA Procurement request provides for the replacement of general and special purpose vehicles, material handling equipment and utility mobile equipment used at HQS DNA and DNA installations. Also included are funds to support the procurement of other capital equipment essential to the performance of agency missions.

The fiscal year 1983 budget provides for acquisition of 33 passenger/cargo-carrying and special purpose vehicles and reflects an increase of $212,000 due to a change in quantity and type of vehicles to be purchased and a requirement for an additional fire truck for Johnston Atoll. Our Other Capital Equipment program for fiscal year 1983 is $1,954,000, up $257,000 from fiscal year 1982. This program would provide $176,000 for printing and reproductive equipment, $375,000 for security equipment, $795,000 for ADP equipment, $219,000 for ONEST equipment, and $389,000 for NUWAX, storage and general equipment.

DEFENSE CONTRACT AUDIT AGENCY

PREPARED STATEMENT OF C. O. STARRETT, JR.
DIRECTOR

Mr. Chairman and Members of the Committee:

I am pleased to appear before you to support the budget request of the Defense Contract Audit Agency (DCAA) for fiscal year 1983. First, a few words on the background of DCAA.

BACKGROUND

Contract audits provide essential financial advice for negotiators and contract administrators during the acquisition process of the Department of Defense. Prior to 1965 each military department performed its own contract audit functions. In December 1964, the Secretary of Defense decided to center the contract audit function in an independent agency reporting at the Secretarial level. Accordingly, the Defense Contract Audit Agency (DCAA) was established.

Organizationally independent of acquisition officials, DCAA services all DoD components responsible for procurement and contract administration. DCAA employs a staff of approximately 3,500 located in 412 offices throughout the continental United States and overseas. About half are located in the larger metropolitan areas, and half work full time at the plants of the larger defense suppliers.

DCAA is basically a one-occupation agency--83 percent of all employees are professional accountants and auditors. Of the accounting and audit staff, 95 percent are college graduates and 20 percent are certified public accountants (CPAs). DCAA also employs a staff of about 35 personnel management and 100 administrative support personnel (computer specialists, budget analysts, etc.). The auditing and administrative effort worldwide is supported by approximately 500 clerical personnel. The organization consists of a small Headquarters located at Cameron Station in the Washington Metropolitan area and six regional offices located in Atlanta, Georgia; Boston, Massachusetts; Chicago, Illinois; Los Angeles, California; Philadelphia, Pennsylvania; and San Francisco, California. In addition, a training facility is located in Memphis, Tennessee.

AGENCY MISSION

The DCAA mission is to assist Department of Defense (DoD) acquisition authorities in achieving sound contract pricing by evaluating pricing proposals submitted by contractors, verifying the propriety and acceptability of costs charged by contractors to flexibly priced Government contracts, and deterring contractors' inefficient practices that, if not detected and corrected, lead to excessive costs and contract prices.

Inherent in the mission that I just described is our audit responsiblity to report suspected fraud or waste that may be identified through our reviews. In this aspect of our work, we refer instances or patterns of suspected irregularities disclosed during our audits to investigative agencies and provide further audit support to the those agencies when requested.

We expect to invest greater effort to examining contractor internal control systems subject to our review to assure they are able to preclude or detect irregularities that may result from either poor system design, inefficient application or intentional manipulation. This is important because the contractor's internal control systems are the foundation for the financial representations subject to our review. Although each contractor is responsible for the installation and maintenance of adequate controls, DCAA is responsible for determining that such controls adequately protect the interests of the Government in administering its contracts and programs.

To further clarify our Agency's mission, let me explain the five functional categories of our workload.

1. Effort Related To Forward Pricing

This audit effort is performed before a contract is awarded. It relates to the time spent in reviewing contract price proposals, and cost accounting standards (CAS) disclosure and impact statements required under Public Law 91-379, an amendment to the Defense Production Act of 1950.

2. Effort Related To Incurred Costs

Incurred cost audits are performed after a contract is awarded. The major portion of the work is the review of costs incurred under cost-reimbursement contracts. Other requirements are: reviews of contractors' compliance with disclosed cost accounting practices; review of termination and other adjustment claims submitted by contractors; and reviews of contractor compliance with the provisions of Public Law 87-653, Truth in Negotiations Act.

3. Other Direct Effort

Other direct effort is all other effort associated with the audits requested by the procurement community in the negotiation, administration, and settlement of contract prices. Included are procurement liaison, interface with the General Accounting Office, special projects and studies, and other miscellaneous direct audit effort.

4. Technical Field Support

This category includes the management and administrative support personnel in the six regional offices and its training facility, the Defense Contract Audit Institute in Memphis, Tennessee. The regional offices provide technical supervision and logistical support in the form of personnel services, payroll, budgeting and accounting, and travel services to field audit office personnel. The Defense Contract Audit Institute provides training for DCAA's audit staff; conducts research and distributes information to the field on operations audits, advance audit techniques, and other auditing practices which have Agency wide application.

5. Headquarters

In addition to the operational function of supervision, direction and guidance of this Agency, the Headquarters organization performs other work normally associated with the central office of a professional agency, i.e., establish policy, provide legal counsel, review and evaluation of field offices and resources management.

About 80 percent of our audit effort is expended in the Forward Pricing and Incurred Cost categories. The other functional areas remain relatively stable each year.

The audit services which DCAA provides to DoD contracting components are also provided to other Federal agencies at contractor locations where DoD has a continuing audit interest. Audits are also performed for the military departments in connection with the Foreign Military Sales (FMS) Program.

The audits for non-DoD agencies and those under the FMS program are performed on a reimbursable basis. We estimate our reimbursable earnings will be about $23 million in both fiscal years 1982 and 1983, which is roughly 18 percent of our annual operating requirements.

FISCAL YEAR 1983 BUDGET SUMMARY

Our fiscal year 1983 budget request of $115.7 million is $12.5 million higher than our FY 1982 funded level. This increase is caused by program changes, inflation and annualization of the 1 October 1981 pay raise.

Program changes accounted for $6.8 million comprised as follows: (1) $6.4 million for 238 additional workyears required for an increased level of price proposal reviews expected in FY 1983 (2) $ .2 million for additional travel required to accomplish the above work and (3) $ .2 million for other miscellaneous increases.

Price changes include $ .8 million for inflation relating to travel, rent, utilities, communications and other miscellaneous support costs and $5.0 million for the annualization of the 1 October 1981 civilian pay raise.

At this time we are also requesting $395,000 under the Procurement Defense Agencies Appropriation for fiscal year 1983. These funds are needed to: (1) replace worn or obsolete equipment that meets the replacement standards established by the General Services Administration; and (2) acquire new equipment for which economic analysis indicates a reduction in operating costs will occur.

WORKLOAD TRENDS

The two factors which directly influence the DCAA workload is the amount of DoD procurement and research and development funds appropriated by Congress each year. The increase in Defense appropriations for fiscal year 1982, which represents significant real growth in the defense budget, will substantially increase the DCAA workload in 1983.

During the past several years, the incurred cost audit workload backlog has increased because of rising DoD Procurement and RDT&E expenditures. With the advent of real growth in the procurement of DoD materiel and services the need for additional audit effort continues to increase. Some of the additional audit effort will be offset through increased productivity brought about through the greater use of advanced audit techniques, investment in training programs designed to increase efficiency, and increased audit awareness and involvement at all levels of management. However, additional staff years of audit effort are required to stay abreast of the projected increases in procurement.

EMPLOYMENT TRENDS

In the past few years hiring limitations have reduced our workforce, while our workload has continued to grow. Although productivity has increased significantly, the increasing backlog resulted in a FY 1983 budget request for an additional 475 authorized end strength over the FY 1982 level. This equates to 238 staff years based on the funds included in our budget request before you today.

This growth is predicated upon the projected increases in our contract audit workload for both preaward and postaward audits on a scale never experienced before. On the basis of the increased tempo in DoD procurement levels, our analysis indicates that there will be a huge increase in proposal evaluations, which constitute the major portion of our work in the preaward category. Further, the number of contractors we audit has steadily increased, necessitating audit visits to many additional locations.

The increase in staffing is necessary if this Agency is to be responsive to the demands of the acquisition community as programs having high national visibility, high priority and significant dollar values are implemented. I am convinced that an increased audit staff can only result in lower contract prices thereby assisting our nation in obtaining the defense capability it needs at an affordable price.

NET SAVINGS

DCAA consistently returns funds to the taxpayer as a result of its operations. For fiscal year 1981 it cost $121 million to do our work (including reimbursement earnings of approximately $22 million), and we achieved $5.7 billion of net savings to the Government through lower procurement costs. The return on a 3-year moving average shows a savings of about $35 for each dollar invested in DCAA.

Shown below are the savings that DCAA has accomplished over the most recent three fiscal years just completed.

Savings
($ in Millions)

	FY 1979	FY 1980	FY 1981
Incurred Costs	$ 571	$ 418	$ 701
Price Proposals	2,587	2,282	4,608
Defective Pricing	7	12	23
Cost Avoidance	214	207	356
Total	$ 3,379	$ 2,919	$ 5,688

CONCLUSION

This concludes my statement. I will be pleased to answer any questions that you and members of your committee may have.

DEFENSE AUDIOVISUAL AGENCY

PREPARED STATEMENT OF ROBERT S. SCOTT

Mr. Chairman and members of the Committee, "I am pleased to appear before this Committee to present the budget requirements of the Defense Audiovisual Agency".

The Defense Audiovisual Agency (DAVA) was established by the Deputy Secretary of Defense (DoD Directive 5040.1) on June 12, 1979. The Assistant Secretary of Defense (Public Affairs) exercises direction, authority, and control over the Agency. DAVA has DoD-wide responsibility for centrally managed audiovisual production, acquisition, distribution, depository functions, and certain other audiovisual services which can be performed more effectively and efficiently on a centralized basis. The Military Departments and other Defense Components retain responsibility for those audiovisual activities which are integral to the performance of operational missions and other Service-unique activities. The spaces, personnel funds, and equipment required to accomplish the Agency mission were transfered from the Military Departments.

The organization of the DAVA consists of a Headquarters and four field activities. The Headquarters is located at Norton Air Force Base, California.

At the time the Agency was established, the Secretary of Defense charged the DAVA Director to implement a 10-15 percent reduction in mission manpower levels within two years from the date on which the Agency became operational. Additionally, sixty-five of the eighty-two manpower spaces required to staff the Headquarters had to be provided from savings generated as a result of improvement, efficiencies, etc. in mission operations. The net effect of these two decisions was a directed manpower reduction of approximately 25% (165 of 678) which was to occur in equal increments during Fiscal Years 1983 and 1984. The current budget request reflects an additional reduction of 88 manpower spaces based on the probable outcome of cost comparison studies currently under way. It is expected that Agency manpower levels will require further adjustment as the results of these studies become known.

	FY 1982	FY 1983
Civilian End Strength	503	330
Military End Strength	136	95

The Fiscal Year 1983 program increase is $.274 million for contract services. Also included is $.260 million for inflation and $.537 million related to the 1 October 1981 civilian salary increase. A transfer of funds from the Military Departments for administrative and logistics support has resulted in an increase of $3.567 million in the FY 1983 budget.

BIOGRAPHY
ROBERT S. SCOTT, DIRECTOR
DEFENSE AUDIOVISUAL AGENCY

Robert S. Scott has been an audiovisual communications consultant and advisor to the Department of Commerce, Department of Housing and Urban Development, as well as the Department of Defense.

Since October 1977, he has also been active as an audiovisual consultant, creative designer, and concept developer for the film and video industry on the west coast and in Washington, D.C.

His experience also includes developing and managing specialized audiovisual communications support for the Air Force Ballistic Missile and Space Systems Division, U.S. Air Force Systems Command. That support included developing requirements for audiovisual reporting systems to be used as management briefings to Government agencies, as well as industrial contractors.

He has received the Presidential Management Improvement Certificate for 1975-76 while assigned as the Assistant Director, Motion Picture and Television Service, United States Information Agency (USIA). While assigned to the USIA, he traveled extensively to USIA posts in all areas of the world, inspecting foreign media facilities and conferring with media managers and creative/technical talent. He was responsible for planning, producing, and distributing films and video tapes in 110 countries to project the image of America abroad.

He has been a member of the Writers' Guild of America and the Washington Film Council, an honorary life member of the Information Film Producers of America, and a director of the Thomas Jefferson Research Center.

A native of San Diego, California, Mr. Scott attended Pomona College, Claremont, California, and graduated from the Feagin School of Radio and Dramatic Art, New York City, prior to a career as actor, writer, director, and producer in New York and Hollywood.

He served in the U.S. Army during World War II, and is a retired Army Lieutenant Colonel.

DEFENSE AUDIT SERVICE

PREPARED STATEMENT OF JOHN W. MELCHNER

Mr. Chairman and Members of the Committee:

I am pleased to present the budget request for the Defense Audit Service for Fiscal Year 1983. First, I would like to summarize the functions and responsibilities of the Defense Audit Service.

AGENCY MISSION

In October 1976, the Defense Audit Service was formed to strengthen the Department of Defense interservice and internal audit programs. Inherent in our mission is the responsibility to plan and perform:

1. Internal audits of the Office of the Secretary of Defense (OSD), the Organization of the Joint Chiefs of Staff, the Unified/Specified Commands and the Defense Agencies;

2. Interservice audits in all Department of Defense Components;

3. "Quick Response" audits on matters of special interest to the Secretary of Defense, including audits designed to disclose fraud, waste and mismanagement in Defense programs;

4. Audits of the Security Assistance Program at all levels of management; and

5. Other audits as required.

The Secretary of Defense also established the position of the Assistant to the Secretary of Defense (Review and Oversight) (ATSD(R&O)) on April 20, 1981. The ATSD(R&O)'s primary responsibility is to serve as the principal advisor to the Secretary of Defense for matters related to the combatting of fraud, waste and abuse in DoD programs and operations. To assist in carrying out this responsibility, the ATSD(R&O) was assigned the duty of direction, authority and control over the Defense Audit Service (DAS) and the Defense Criminal Investigative Service (DCIS).

In FY 1982, DAS became responsible for providing administrative support to the DCIS, which was formed by a functional transfer of 100 manpower spaces and resources from the Defense Investigative Service. DCIS is a Federal law enforcement agency that was established to investigate criminal or fraudulent activities in Department of Defense programs and operations within any Defense Agency or OSD component, as well as criminal or fraudulent activities that have multiservice impact. DCIS is under the leadership and operational control of Mr. Brian Bruh, its Director.

FISCAL YEAR 1983 BUDGET SUMMARY

Our FY 1983 budget request of $23.3 million is $3.9 million higher than our FY 1982 funding level. This increase is due to anticipated inflation costs of $1.0 million and $2.9 million needed to provide for additional auditor and investigator salaries and related travel and other costs.

EMPLOYMENT TRENDS

Considering the scope and complexity of our mission, we have operated and continue to operate, with a lean staff. Our authorized DAS/DCIS end-strength in FY 1982 is 501. Our FY 1983 request for DAS/DCIS totals 557, an increase of 56 spaces. This increased personnel need results from additional workload assigned to the Defense Audit Service which involve special projects emanating from the President's Council on Integrity and Efficiency (PCIE), the DoD Hotline and the recent Government-wide emphasis on detecting and preventing fraudulent, wasteful and abusive practices. The added strength is also designed to provide increased reviews in such important areas as DoD procurement and contract administration operations, which have not always received full audit coverage due to limited resources.

AUDIT PRIORITIES AND EMPHASIS

Fiscal year 1981 brought increased attention from Congress, the Executive Office, DoD managers and the public on the efficiency and effectiveness of Government operations and accountability of Government officials to taxpayers. The PCIE, composed of an official of the Office of Management and Budget, the Inspectors General of civil agencies, the Assistant to the Secretary of Defense (Review and Oversight), representatives of the Department of Justice, Treasury, the Federal Bureau of Investigation and Office of Personnel Management, was established to review functions common to all Executive level departments and agencies. The purpose of the PCIE is to find ways of making Government operations more efficient and effective and managers more accountable to the taxpayers. The Defense Audit Service fully supports the efforts of the PCIE. We were the lead audit agency on planned Government-wide audits of Government-furnished materiel in the hands of contractors and civilian payrolls. Other areas we audited included unliquidated obligations related to real property construction and selected imprest fund revenues and expenditures. DoD is participating in 14 of the 18 PCIE projects and DAS is actively involved in 12 of these.

Audits of areas susceptible to fraud, waste and mismanagement, which we call protective audits, continue to receive high priority in our audit planning process. These actions are only a part of our contribution to a high level of management proficiency and financial integrity in the Department of Defense.

AUDIT ACCOMPLISHMENTS

During FY 1981, we issued 135 audit reports. It is not always possible to quantify savings and other benefits derived from our audits. However, in FY 1981, we identified potential economies of about $486 million or about $30 for every dollar spent on audit resources. About $110 million of these potential benefits were recurring and the remaining $376 million were one-time savings. In addition, many of our recommendations were made to improve internal controls, thereby reducing the probability for fraud or waste and increasing the potential for further savings.

This concludes my presentation. I will be pleased to answer any questions that you and members of your committee may have or furnish you any additional materials you may desire concerning our organization.

DEFENSE INVESTIGATIVE SERVICE

PREPARED STATEMENT OF THOMAS J. O'BRIEN
DIRECTOR

Personnel Security Investigative Program

The United States General Accounting Office in its report, "Faster Processing of DoD Personnel Security Clearances Could Avoid Millions in Losses (B-204570)," dated September 15, 1981, estimated $923 million annually could be avoided if personnel security investigations were completed within DoD standards. In June 1981 the Department of Defense notified this committee of interim actions to address the report.

The Department of Defense, as directed in your report on the 1982 Appropriations Bill, has proceeded with the addition of government service investigators. The Defense Audit Service conducted a major management study of the agency to determine needed requirements, and based on their study DoD has added 768 spaces to the personnel security investigative (PSI) function in FY 1982 and FY 1983. These additional spaces, along with policy changes, are designed to reduce the 170 day average PSI case completion time to the 65-day DoD goal and meet estimated workloads during FY 1983. The Deputy Secretary of Defense directed two major policy changes. They were a temporary suspension of reinvestigations until the 65-day completion time goal is met and adoption of the Interview-Oriented Background Investigation.

Interview-Oriented Background Investigation

The introduction of the Interview-Oriented Background Investigation (IBI) may be the most significant development in the entire PSI field in the last 30 years. In the past, our investigators went to the subject's school and employment, both current and former, to talk to teachers, supervisors, co-workers and associates. Our society has become more transient and many people do not know their neighbors. Traditional codes of conduct have been questioned in many quarters. Moreover, people today are simply not as forthcoming with federal investigators as they were in the past. There is widespread misunderstanding of the Privacy Act. People are concerned that, if they provide information concerning their associates or neighbors, they may become entangled in a lawsuit.

The IBI addresses and counters many of these problems so that the nation's classified information can still be entrusted only to those citizens who have been found to be trustworthy and loyal. In the IBI, we conducted an in-depth interview with the subject of the inquiry as an integral part of each inquiry. Essentially, we are going to the best source of all because no one knows as much about an individual as that individual does. The IBI with its subject interview is producing more trenchant material than the old investigative scope. The IBI is in keeping with the Privacy Act in that it obtains the information directly from the individual concerned rather than other sources. It should be pointed out that the IBI still includes national and local police checks and credit checks. Other traditional leads are conducted if they are warranted based on the subject interview or record checks. It should be pointed out that the subject interview and follow-up interview to refine issues are quite time consuming, but the results are worthwhile.

Industrial Security Program

With the transfer of the Industrial Security Program to DIS in FY 1981, 88 spaces were added to the program. This increase has allowed emphasis to be placed on the quality in the program. The contractor inspections are now emphasizing depth, quality and timeliness, as well as greater effort on security education and training of contractor personnel. The program also has experienced growth in workload because of increasing DoD contracting activity and increase in difficulty of inspection. The number of contractor ADP systems processing classified information, and hence requiring inspection, has grown from 1,489 systems at the end of FY 1979 to 3,565 at the end of FY 1981. The number of such systems are estimated to be about 5,200 at the end of FY 1982.

Law Enforcement Transfer

This budget request reflects the transfer in FY 1982 of $1.9 million and 100 spaces to the Defense Audit Service. The transfer is that of the law enforcement mission resources except for the responsibility for compromised classified information. These resources will provide the new Assistant to the Secretary of Defense (Review and Oversight) with a law enforcement investigative capability.

Operation and Maintenance Budget Request

The $86.6 million budgeted in the fiscal year 1981 column of our Operation and Maintenance request is $10.5 million greater than the $76.1 million appropriated to DIS. The increase includes (1) $2.7 million for civilian pay raise supplemental, (2) $9.6 million for the transfer of 768 spaces from the military departments to reduce case completion times, (3) transfer of $1.9 million and 100 spaces to the Defense Audit Service for criminal investigation mission and (4) $.1 million program supplemental for increased health insurance and postal rate.

The fiscal year 1983 budget request of $98.2 million is 11.6 million greater than the $86.6 million budgeted for fiscal year 1982. This increase includes (1) $1.0 million for built-in items (e.g. inflation and annualization of pay raises), (2) $9.2 million annualization of costs related to the 768 space increase in FY 1982, (3) $.8 million for the 65 military spaces to complete civilianization of the personnel security investigation mission, and (4) $.6 million for the application of ADP techniques and equipment to improve timeliness and control of operation and replacement of the interim GSA approved computer.

Procurement Budget Request

The FY 1983 procurement request is for $6.3 million, of which all but $31 thousand is for 1,018 motor vehicles. The vehicles are required for three reasons: (1) to provide 633 sedans for the investigators in the 768 space increase; (2) to replace 233 of the 382 sedans which meets the DoD replacement criteria; and (3) 152 sedans to support the Industrial Security program transferred to DIS in FY 1982.

Civilianization Program

The FY 1983 request includes $.8 million for the conversion of 65 military spaces to civilian spaces. This completes the Congressional-directed program started in FY 1981 to civilianize the 200 remaining military spaces in the PSI mission. This leaves only 15 military positions transferred for the Industrial Security Program and these spaces are scheduled to phase out in FY 1984.

Mr. Chairman, this concludes my prepared statement. I will be happy to attempt to answer any questions you may have.

OPERATION AND MAINTENANCE, DEFENSE AGENCIES

PREPARED STATEMENT OF DAVID O. COOKE

DEPUTY ASSISTANT SECRETARY OF DEFENSE (ADMINISTRATOR)

Mr. Chairman and Members of the Committee:

I am pleased to appear again before this committee to present the budget requirements of the Office of the Secretary of Defense, the Washington Headquarters Services, the Organization of the Joint Chiefs of Staff, the American Forces Information Services, the Medical Information Systems, the Department of Defense Dependents Schools program, the Office of Economic Adjustment, and the Defense Legal Services. If they have not already done so, representatives of other activities included in the Operation and Maintenance, Defense Agencies appropriation will make their individual presentations to you.

The pay, allowances and permanent change of station costs for military personnel assigned to these activities are not included in the estimates, I will address. Such costs are contained in the military personnel appropriation estimates of the Military Departments and will be addressed by their witnesses. These estimates do include, however, all other support costs for military personnel assigned to these activites, such as temporary duty travel, supplies and office equipment.

Office Of The Secretary of Defense

The FY1983 budget request of $107,307,000 represents an increase of $10,959,000 over the current year requirements, as shown in Attachment 1.

The net increase of $3,565,000 in personnel costs is broken out as follows: $4,174,000 is for the 1 October 1981 pay raise, including the impact of the pay ceiling removal; $204,000 is for increased terminal leave payments; $99,000 is additional overtime costs; and $1,195,000 is for an additional 25 workyears of employment. These increases are partially offset by a decrease of $2,107,000 which was the amount transferred with 53 employees of the Office of General Counsel to the new Defense Legal Services (DLS) organization.

The travel estimate of $4,700,000 is an increase of $703,000 over the FY1982 estimate of $3,997,000. $320,000 of the increase is attributed to inflation while approximately $139,500 of the increase is for travel costs required by the renewed SALT talks.

The additional $68,000 in official representation funds represents an increase of 10.7% and is attributable primarily to inflation.

Funding for contracts, studies and analyses is increased by $6,623,000, which is 15.5% higher than FY1982. Of this increase, $2,575,000 is for the Joint Recruiting Advertising Program (JRAP). As part of the DoD effort to achieve Economies and Efficiencies, increased emphasis is being placed on the JRAP, while the individual Services' advertising budgets are being proportionally reduced. Another $1,094,000 of the increase is in the Joint Market Research Program (JMRP) which is a continuing study of the market for Military Service recruiting efforts. Excluding these two programs which support Service recruiting efforts, the balance of the increase in study funds is $2,954,000. The greater portion of this increase is due to price inflation, with a small portion representing program growth. Management study contracts constitute an integral part of the decision-making process at the senior management level of the Department of Defense. There is almost no area of Defense policy-making, resource management or scientific/technical effort that has not received significant benefit from OSD-sponsored study support.

Attachment 2 pertains to the personnel requirements of the Office of the Secretary of Defense.

Washington Headquarters Services

The Washington Headquarters Services, established in 1977, represents a consolidation of functions which provide a variety of administrative services and operating support to the Office of the Secretary of Defense and certain Defense Agencies and joint activities which do not have internal support capability. For reasons of economy and efficiency, these agencies were not authorized their own support capability at the time of their establishment. Washington Headquarters Services enables support functions to be centralized for maximum efficiency and control. Correspondence control and mail service, records management, directives management, office services, personnel administration, security service, budget and accounting services, and other miscellaneous activities are examples of the administrative services and operational support that Washington Headquarters Services provides.

In addition to these traditional types of support, Washington Headquarters Services also (1) administers information and data systems in support of the Office of the Secretary of Defense decision and policymaking process. This includes management information collection and reports preparation in the areas of procurement, logistics, manpower, and economics; (2) provides computer services and associated support to the Office of the Secretary of Defense, to include: validation of Automated Data Processing requirements, management and control of Automated Data Processing resources, systems development and operation, and the provision of consulting services; and (3) manages Department of Defense occupied, General Services Administration controlled administrative space in common support facilities. This includes office space, concessions, layout design, and other related building administration functions.

The Washington Headquarters Services FY1983 budget request of $64,616,000 exceeds the current year program by $9,581,000. Of this amount, 34 percent, or $3,216,000, is price inflation and 66 percent, or $6,365,000, is net program growth. Washington Headquarters Services program growth consists of the following: $4,883,000 for planned increases in automatic data processing services and systems; $477,000 for 17 additional workyears; $149,000 for anticipated increases in printing and reproduction services; and $906,000 of net program growth for communications, supplies, materials, equipment and minor increases in travel and transportation of persons and transportation of things.

The increase in automatic data processing services is predicated upon the urgent need to substantially improve the automatic data processing support provided to the Office of the Secretary of Defense staff. Major emphasis will be directed to increasing staff productivity through office automation. This includes substantive increases in the use of word processing equipment, secure microprocessors and graphic systems.

Attachment 3, Summary of Financial Requirements, presents the changes in the Washington Headquarters Services program by type of expense.

A summary of personnel requirements is provided as Attachment 4.

Organization of the Joint Chiefs of Staff

Next, Mr. Chairman, I invite your attention to the aggregated budget requirements of the Organization of the Joint Chiefs of Staff (OJCS). Within the total, there are three areas budgeted for and financed by the resources requested.

The first area provides for departmental administration which includes costs for civilian pay, travel, purchases, and other operation and maintenance operating expenses.

The second is JCS Directed and Coordinated Exercises. The Fiscal Year 1982 Defense Appropriation Bill transferred exercise airlift and sealift funds from the individual Service appropriations to the O&M Defense Agencies appropriation where they will be managed, supported and defended by the Joint Chiefs of Staff. This procedure, as demonstrated already in fiscal year 1982, provides flexibility to alter the exercise program and reallocate forces and funds as required to respond to changing world situations.

In fiscal year 1983, the JCS directed and coordinated exercise program includes 24 joint/combined exercises that are directed by the JCS and 49 that require JCS scheduling coordination.

Joint and combined exercises are a primary means of evaluating and ensuring total force readiness. Joint exercises are essential for testing operation plans, improving command, control, and communications (C3) interoperability, and meeting joint readiness and training objectives. Combined exercises serve the same purpose in addition to evaluating defense arrangements with U.S. allies. The exercises are directed or coordinated under JCS guidance to preclude redundancy in exercise objectives and over-committment of forces.

The third is the CINC Readiness Fund. The Cinc Readiness Fund is a new $100 million budget program designed to provide for the timely financing of contingency readiness requirements of the commanders of the unified and specified commands (CINCs) . The fund will be used by those commanders to improve forces readiness, war-fighting effectiveness, and efficiency of operations for items for which expenditures are not specifically authorized in other operation and maintenance and procurement appropriations of the Department of Defense, other than major end items. Since the requirements that will be considered are unknown and unplanned at this time, the fund has not been subdivided by expense item. Funds are to be expended on the approval or authority of the Chairman of the Joint Chiefs of Staff.

Changes Between Fiscal Years 1982 and 1983. The fiscal year 1983 budget for this organization is $363,503,000. This represents an increase of $72,783,000 from the revised fiscal year 1982 level of $290,720,000 as shown in attachment 5.

The year-to-year increase is a net change due to increases totaling $108,835,000 which are offset by decreases which total $36,052,000. The increases are broken out as follows: $100,000,000 for the new CINC Readiness Fund; $1,002,000 for administrative costs including full staffing of civilian positions, travel for increases or reinstituted international negotiations, and purchases of utilities communications supplies and equipment; $5,790,000 for increased sealift support; and price inflation of $2,043,000. These increases from FY1982 to FY1983 were partially offset by program decreases of $16,596,000 in airlift support and $19,456,000 in the JCS exercise program.

You will find two charts at Attachments 5 and 6 which address the total financial and personnel requirements of the OJCS.

American Forces Information Service

The FY1983 budget estimate for the American Forces Information Service (AFIS) is $37,000,000, which represents a net increase of $4,934,000 over the revised FY1982 estimate of $32,066,000. This program is responsible for providing wherewithal, policy and guidance throughout the Department of Defense to ensure a free flow of news and information to our military personnel by means of the broadcast and print media. Much of the materials, operations, and services are contracted for with commercial sources.

The funding increase of $4,934,000 reflects increases attributable to price growth of $1,995,000 and a net program increase of $2,939,000. The price growth is made up of $1,992,000 for inflation and $3,000 in pay raise annualization costs. The net program increase of $2,939,000 results from program increases in several areas offset by decreases in other areas as follows:

Program increases totaling $6,421,000: $60,000 in travel costs as a result of required negotiations with host countries and inspection of planned sites for American Forces Radio and Television Service Satellite Network (AFRTS SATNET); $38,000 for increased costs for bulk shipment of printed materials through the

Government Printing Office, and shipment of mini-TV cassettes to Defense personnel at Diego Garcia; $4,853,000 for full implementation of AFRTS SATNET; $94,000 for increased space rental rate resulting from AFIS forces relocation; $60,000 due to an increased utility rate for satellite dish at the American Forces Radio and Television Service-Programming Center (AFRTS-PC) in Los Angeles which will be used full power in FY1983; $110,000 for software for the Management Information System which is in compliance with Department of Defense Directive 5122.10; $435,000 increased funding for the acquisition of broadcast materials and contractor costs associated with radio/television program duplication and distribution; $771,000 for other supplies to include videotape and shipping containers.

Program decreases totaling $1,487,000: Based on FY1981 actual obligations, we have budgeted at a lower workyear cost for FY1983 resulting in a savings of $[illegible],000; there is another savings of $111,000 due to a voluntary reduction of printing and reproduction in consideration of the moratorium in this cost area; there is a $1,104,000 reduction in radio and TV programming; another $136,000 will be saved on equipment purchases due to reduced furniture and special purpose/technical equipment requirements.

Attachments 7 and 8 pertain to the budget of the American Forces Information Service.

Medical Information Systems

The Fiscal Year 1983 Medical Information Systems (MIS) budget request of $50,906,000 represents an increase of $4,060,000 over the current year revised estimate. MIS includes two major activities:

a. Support to the Assistant Secretary of Defense (Health Affairs), including the Defense Enrollment/Eligibility Reporting System (DEERS), Uniform Chart of Accounts (UCA), and the Data Management Information System (DMIS).

b. The Tri-Service Medical Information Systems (TRIMIS) Program. The TRIMIS Program provides centralized Department of Defense (DoD) management to realize the benefits of Automatic Data Processing (ADP) technology in improving the effectiveness and economy of health care by the Military Departments.

Program increases totaling $10,600,000 are anticipated for eight TRIMIS projects that will see eight systems installed in 28 facilities in Fiscal Year 1983. More than $6,000,000 (60%) of the planned increase is for implementation of three Congressionally directed Hospital Information Systems. The balance is for seven other TRIMIS projects which are expanding to 25 additional sites. The cost includes site preparation, communications, rental and maintenance of ADP equipment and software.

Program decreases totaling $6,540,000 are planned for two TRIMIS Systems and for DEERS. The Food Service and Logistics Systems are being converted from time-sharing support to on-site computers and costs are decreasing. DEERS, however, accounts for more than $4,000,000 (60%) of the total decrease, because DEERS will be fully operational in Fiscal Year 1982 in the continental United States and development costs are rapidly decreasing.

Department of Defense Office of Dependents Education

The budget request for the Office of Dependents Education for FY1983 is $537,949,000. These resources are for funding the education of minor dependents of Department of Defense military and civilians in overseas areas. Included in this amount are funds for the Section Six Schools program which Defense has assumed the responsibility for funding from the Department of Education.

The Overseas Dependents Schools program for FY1983 is $437,697,000, an increase of $46,444,000 over the FY1982 funding level of $391,253,000. Of this increase, $28,932,000 represents inflation and $17,512,000 represents program growth. The FY1983 funding will provide for the continuation of the educational programs conducted in FY1982 and provide for increased costs of the programs, including educational and logistic support costs, tuition-fee schools, transportation and costs unique to operating overseas dependents schools. The request also provides for restoration of enhanced educational programs for handicapped and student food services programs delayed for one year by FY1982 budget revisions.

The budget request for the Section Six Schools program for FY1983 is $100,252,000. The mission of the Section Six School Program is to insure the provision of education to children who reside on Federal property where the state or local educational agency is unable because of legal or other reasons to provide a suitable free public education. The $100,252,000 level is an increase of $9,705,000 over the FY1982 funding of $90,547,000. Of this increase, $5,512,000 represents price inflation and $4,193,000 represents program growth. The request for FY1983 continues current year programs for nine schools operated by the Army, two operated by the Navy, three operated by the Marine Corps, four operated by the Air Force, and four arrangements with local school districts including one for Coast Guard dependents and one for US Part Service dependents. All are reimbursable programs formerly funded by the Department of Education.

Attachments 11 and 12 relate to the Department of Defense Dependents Schools.

Office of Economic Adjustment

The cost for operation and maintenance of the Office of Economic Adjustment (OEA) for FY1983 will amount to $2,625,000. Since 1961, this office has provided coordinated Federal economic development opportunities to individuals and communities to alleviate dislocation engendered by changes in Department of Defense activities. Assistance is provided when DoD actions result in closures of military installations, reduction in installation personnel and cutbacks in DoD contracts. Since 1970 OEA has served as the permanent staff of the President's Economic Adjustment Committee (EAC). Public Law 9687 (FY1982 Defense Authorization Act) specifically directed OEA to assist communities affected by expansion of military activities.

In localities where there is a reduction of military activities, OEA works along with local, state and concerned Federal agencies to develop strategies and coordinate action plans to generate new job opportunities and to minimize the social and economic distress. Former military bases may be converted for civilian uses: airports, schools, hospitals, recreational areas, industrial parks, etc. In cases where the impact is related to an expansion of military activities, economic adjustment assistance is needed to provide the needed infrastructure (water, sewer, roads, schools, housing, etc.), as well as creating economic linkages required to support the expanded military activity. Available Federal, state and local government economic adjustment aid resources are utilized to attract private sector resources to the affected communities. In the future OEA will be called upon to provide assistance that was traditionally provided by State and other Federal aid programs to these communities to secure needed resources.

The FY1983 request of $2,625,000 represents a $509,000 increase over the FY1982 budget. This amount includes a program increase of $319,000 in contracts due to a substantial increase in the need for impact aid above the level of the past two years, and a program increase of $97,000 in salaries, travel, services and office support. The price growth in FY1983 is $93,000 due to inflationary costs.

DEFENSE LEGAL SERVICES

The Defense Legal Services Agency was established on August 12, 1981, pursuant to a Secretarial Directive to consolidate the management of lawyers in the Office of the Secretary of Defense and the Defense Agencies under the General Counsel of the Department of Defense. The mission of the Defense Legal Services is to provide legal advice and services for the Office of the Secretary of Defense and its field activities and the Defense Agencies. In addition, it provides technical support and assistance for development of the Department of

Defense Legislative Program, coordinates Department of Defense positions on legislation and Presidential Executive Orders, provides a centralized legislative and Congressional document reference and distribution point for the Department of Defense, maintains the Department's historical legislative files, and performs such other related functions as are within the authority of the General Counsel of the Department of Defense.

The FY1983 initial funding request is $2,166,000.

Summaries of the Defense Legal Services Agency financial and personnel requirements are provided at attachments 15 and 16 respectively.

OFFICE OF THE SECRETARY OF DEFENSE
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 1

Type of Expense	FY1981	FY1982 President's Budget	FY1982 Adjustment	FY1982 Revised Estimate	FY1983 Increases/ Decreases	FY1983 Budget Estimate
Civilian Personnel Costs	46,086	51,714	-2,643	49,071	+3,565	52,636
Travel of Personnel	2,629	3,997	-	3,997	+703	4,700
Transportation of Things	-	-	-	-	-	-
Rents, Utilities, and Communications	-	-	-	-	-	-
Printing and Reproduction	-	-	-	-	-	-
Other Purchased Services						
Contracts	28,667	33,701	+8,929	42,630	+6,623	49,253
Other	4,656	400	+250	650	+68	718
Supplies and Materials	-	-	-	-	-	-
Equipment	-	-	-	-	-	-
Total (Direct Obligations)	82,038	89,812	+6,536	96,348	10,959	107,307

OFFICE OF THE SECRETARY OF DEFENSE
SUMMARY OF PERSONNEL REQUIREMENTS

Attachment 2

	FY1981 Actual	FY1982			FY1983 Budget Estimate
		President's Budget	Adjustments	Revised Estimate	
Year End Strength					
Civilian					
Full Time	1,135	1,189	-18	1,171	1,171
Other	143	50	-	50	50
Subtotal-Civilian	1,278	1,239	-18	1,221	1,221
Military	461	411	+14	425	425
Total-Year End	1,739	1,650	-4	1,646	1,646
Average Employment					
Civilian					
Full Time	1,109	1,189	-62	1,127	1,135
Other	100	49	+43	92	109
Subtotal-Civilian	1,209	1,238	-19	1,219	1,244
Military	422	411	+13	424	424
Total-Average Employment	1,631	1,649	-6	1,643	1,668

WASHINGTON HEADQUARTERS SERVICES
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 3

Type of Expense	FY1981	FY1982			FY1983	
		President's Budget	Adjustment	Revised Estimate	Increases/ Decreases	Budget Estimate
Personnel Compensation & Benefits	9,971	10,830	-275	10,555	1,112	11,667
Travel & Transportation of Persons	402	370	55	425	29	454
Transportation of Things	90	50	30	80	15	95
Standard Level User Charges	5,966	6,413	34	6,447	229	6,676
Communications, Utilities & Other Rent	4,132	5,264	-644	4,620	594	5,214
Printing and Reproduction	2,599	3,117	184	3,301	350	3,651
Other Services	19,768	26,584	882	27,466	7,016	34,482
Supplies and Materials	1,185	866	540	1,406	146	1,552
Equipment	567	1,106	-371	735	90	825
Total (Direct Obligations)	44,680	54,600	435	55,035	9,581	64,616

WASHINGTON HEADQUARTERS SERVICES
SUMMARY OF PERSONNEL REQUIREMENTS

Attachment 4

	FY1981 Actual	FY1982			FY1983 Budget Estimate
		President's Budget	Adjustments	Revised Estimate	
Year End Strength					
Civilian					
Full Time	295	329	5	334	336
Other	34	56	-	56	56
Subtotal-Civilian	329	385	5	390	392
Military	96	87	10	97	97
Total-Year End	425	472	15	487	489
Average Employment					
Civilian					
Full Time	320	329	-2	327	327
Other	17	56	27	83	100
Subtotal-Civilian	337	385	25	410	427
Military	96	87	10	97	97
Total-Average Employment	433	472	35	507	524

ORGANIZATION OF THE JOINT CHIEFS OF STAFF
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 5

Type of Expense	FY 1981 Actual	FY 1982 President's Budget	FY 1982 Adjustment	FY 1982 Revised Estimate	FY 1983 Increases/ Decreases	FY 1983 Budget Estimate
Civilian Personnel Costs	7,136	7,380	+403	7,783	+217	8,000
Undistributed Reduction	-	-	-447	-447	+447	-
Travel of Personnel	1,319	1,737	-	1,737	+357	2,094
Transportation of Things	-	2	+273,200	273,202	-29,262	243,940
Rents, Utilities, and Communications	5,554	5,969	-226	5,743	+481	6,224
Printing and Reproduction	181	218	-	218	+ 30	248
Other Purchased Services						
(Contracts)	25	100	-	100	+ 75	175
(Other)	1,647	1,366	+ 98	1,464	+100,272	101,736
Supplies and Materials	684	570	+190	760	+110	870
Equipment	123	160	-	160	+ 56	216
Total (Direct Obligations)	16,669	17,502	+273,218	290,720	+72,783	363,503

Attachment 6

ORGANIZATION OF THE JOINT CHIEFS OF STAFF
SUMMARY OF PERSONNEL REQUIREMENTS

	FY 1981 Actual	FY 1982			FY 1983 Budget Estimate
		President's Budget	Adjustment	Revised Estimate	
Year End Strength					
Civilian					
Full Time	263	281	+ 4	285	285
Other	18	7	+ 2	9	9
Subtotal-Civilian	281	288	+ 6	294	294
Military	1,039	1,049	+22	1,071	1,083
Total-Year End	1,320	1,337	+28	1,365	1,377
Average Employment					
Civilian					
Full Time	259	274	+ 7	281	281
Other	17	8	+ 1	9	9
Subtotal-Civilian	276	282	+ 8	290	290
Military	1,033	1,049	+ 6	1,055	1,077
Total-Average Employment	1,309	1,331	+14	1,345	1,367

AMERICAN FORCES INFORMATION SERVICE
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 7

Type of Expense	FY1981 Actual	President's Budget	FY1982 Adjustment	Revised Estimate	FY1983 Increases/ Decreases	Budget Estimate
Civilian Personnel Costs	3,844	4,308		4,308	- 136	4,172
Travel of Personnel	166	182		182	+ 60	242
Transportation of Things	57	60		60	+ 38	98
Rents, Utilities, and Communications	8,420	10,695		10,695	+5,117	15,812
Printing and Reproduction	1,685	1,919		1,919	- 111	1,808
Other Purchased Services						
Contracts	8,638	9,604	+7	9,611	+ 435	10,046
Other	3,202	3,328		3,328	-1,104	2,224
Supplies and Materials	2,214	1,732		1,732	+ 771	2,503
Equipment	855	231		231	- 136	95
Total (Direct Obligations)	29,081	32,059	+7	32,066	+4,934	37,000

AMERICAN FORCES INFORMATION SERVICE
SUMMARY OF PERSONNEL REQUIREMENTS

Attachment 8

	FY1981 Actual	FY1982			FY1983 Budget Estimate
		President's Budget	Adjustment	Revised Estimate	
Year End Strength					
Civilian					
Full Time	126	131	-	131	131
Other					
Subtotal-Civilian	126	131	-	131	131
Military	49	50	-	50	50
Total-Year End	175	181	-	181	181
Average Employment					
Civilian					
Full Time	126	131	-	131	131
Other					
Subtotal-Civilian	126	131	-	131	131
Military	49	50	-	50	50
Total-Average Employment	175	181	-	181	181

MEDICAL INFORMATION SYSTEMS
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 9

Type of Expense	FY1981 Actual	FY1982			FY1983	
		President's Budget	Adjustment	Revised Estimate	Increases/ Decreases	Budget Estimate
Civilian Personnel Costs	715	889	—	889	2	891
Travel of Personnel	222	392	—	392	33	425
Rents, Utilities, and Communications	141	162	—	162	8	170
Other Contracts	34,124	45,388	—	45,388	4,016	49,404
Supplies and Materials	7	10	—	10	1	11
Equipment	—	5	—	5	—	5
Total (Direct Obligations)	35,209	46,846	—	46,846	4,060	50,906

Attachment 10

MEDICAL INFORMATION SYSTEMS
SUMMARY OF PERSONNEL REQUIREMENTS

	FY1981 Actual	1982			1983 Budget Estimate
		President's Budget	Adjustments	Revised Estimate	
Year End Strength					
Civilian					
Full Time	27	27	—	27	27
Other	—	—	—	—	—
Subtotal Civilian	27	27		27	27
Military	23	23	—	23	23
Total Year End	50	50	—	50	50
Average Employment					
Civilian					
Full Time	21	27	-2	25	27
Other	—	—	—	—	—
Subtotal Civilian	21	27	-2	25	27
Military	23	23	—	23	23
Total-Average Employment	44	50	-2	48	50

DEPARTMENT OF DEFENSE DEPENDENTS SCHOOLS
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 11

Type of Expense	FY 1981 Actual	FY 1982 President's Budget	FY 1982 Adjustment	FY 1982 Revised Estimate	FY 1983 Increases/ Decreases	FY 1983 Budget Estimate
Civilian Personnel Costs	227,479	270,927	-21,670	249,257	15,287	264,544
Travel of Personnel	9,788	65,254	-11,786	53,468	3,115	56,583
Transportation of Things	47,293	13,965	1,360	15,325	-1,350	13,975
Rents, Utilities, and Communications	23,503	21,490	5,536	27,026	3,370	30,396
Printing and Reproduction						
Other Purchased Services						
Contracts	103,828	6,016	102,177	108,193	19,618	127,811
Other	22,266	23,350	-698	22,652	1,920	24,572
Supplies and Materials	23,393	21,362	-16,615	4,747	7,528	12,275
Equipment	7,316	4,617	- 3,485	1,132	6,661	7,793
Total (Direct Obligations)	*464,866	426,981	54,819	*481,800	56,149	*537,949

*Includes Section Six Schools Programs Costs Transferred from Ed. Dept. as follows:

FY 1981 Actual	FY 1982 Revised Estimate	FY 1983 Budget Estimate
$ 82,436	$ 90,547	$ 100,252

DEPARTMENT OF DEFENSE DEPENDENTS SCHOOLS
SUMMARY OF PERSONNEL REQUIREMENTS

ATTACHMENT 12

	FY 1981 Actual	FY 1982			FY 1983
		President's Budget	Adjustments	Revised Estimate	Budget Estimate
*Year End Strength					
Civilian					
Full Time	9,499	10,396	-	10,396	10,090
Other	780	1,045	-	1,045	1,045
Subtotal-Civilian	10,279	11,441	-	11,441	11,135
Military					
Total-Year End	10,279	11,441	-	11,441	11,135
*Average Employment					
Civilian					
Full Time	9,919	10,300	275	10,575	10,107
Other	780	780	-	780	1,045
Subtotal-Civilian	10,699	11,080	275	11,355	11,152
Military					
Total-Average Employment	10,699	11,080	275	11,355	11,152

*Does Not Include 7 Positions To Be Transferred From Ed. Dept. for Section Six School Programs

OFFICE OF ECONOMIC ADJUSTMENT
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 13

Type of Expense	FY1981	FY1982			FY1983	
		President's Budget	Adjustment	Revised Estimate	Increases/ Decreases	Budget Estimate
Civilian Personnel Costs	1,029	1,136	+9	1,145	23	1,168
Travel of Personnel	76	75	-	75	28	103
Transportation of Things	3	5	-	5	5	10
Rents, Utilities, and Communications	104	114	-	114	23	137
Printing and Reproduction	34	25	-	25	24	49
Other Purchased Services						
Contracts	614	1,024	-293	731	364	1,095
Other	23	14	-	14	36	50
Supplies and Materials	1	4	-	4	4	8
Equipment	-	3	-	3	2	5
Total (Direct Obligations)	1,884	2,400	284	2,116	509	2,625

OFFICE OF ECONOMIC ADJUSTMENT
SUMMARY OF PERSONNEL REQUIREMENTS

Attachment 14

	FY1981 Actual	FY1982			FY1983 Budget Estimate
		President's Budget	Adjustments	Revised Estimate	
Year End Strength					
Civilian					
Full Time	25	27	-	27	27
Other	2	2	-	2	2
Subtotal-Civilian	27	29	-	29	29
Military	3	3	-	3	3
Total-Year End	30	31	-	31	31
Average Employment					
Civilian					
Full Time	28	28	-	28	28
Other	2	2	+1*	3	2
Subtotal-Civilian	30	30	-	31	30
Military	3	3	-	3	3
Total-Average Employment	33	33	+1	34	33

* Increase of 1 space for President's Exchange Program

DEFENSE LEGAL SERVICES
SUMMARY OF FINANCIAL REQUIREMENTS
(In Thousands of Dollars)

Attachment 15

Type of Expense	FY1981	FY1982			FY1983	
		President's Budget	Adjustment	Revised Estimate	Increases/ Decreases	Budget Estimate
Personnel Compensation & Benefits	-	-	-	-	2,130	2,130
Travel & Transportation of Persons	-	-	-	-	36	36
Total (Direct Obligations)	-	-	-	-	2,166	2,166

DEFENSE LEGAL SERVICES
SUMMARY OF PERSONNEL REQUIREMENTS

Attachment 16

	FY1981 Actual	FY1982			FY1983 Budget Estimate
		President's Budget	Adjustments	Revised Estimate	
Year End Strength					
Civilian					
Full Time	-	-	53	53	53
Other	-	-	-	-	-
Subtotal-Civilian	-	-	53	53	53
Military	-	-	-	-	-
Total-Year End	-	-	53	53	53
Average Employment					
Civilian					
Full Time	-	-	53	53	53
Other	-	-	-	-	-
Subtotal-Civilian	-	-	53	53	53
Military	-	-	-	-	-
Total-Average Employment	-	-	53	53	53

CIVILIAN HEALTH AND MEDICAL PROGRAM OF THE UNIFORMED SERVICES

PREPARED STATEMENT OF THEODORE D. WOOD
DIRECTOR

Mr. Chairman and Members of the Subcommittee

I am Theodore D. Wood, Director of the Office of Civilian Health and Medical Program of the Uniformed Services (OCHAMPUS). I am representing the Secretary of Defense in these hearings to discuss the CHAMPUS budget for the Fiscal Year 1983. I want to express my appreciation for the opportunity to appear before this Subcommittee.

As you know, CHAMPUS augments the military's direct medical care services. CHAMPUS shares the costs of health care in civilian facilities for uniformed service families, retirees and their dependents and survivors. CHAMPUS is administered by the Office of the Secretary of Defense through the Office of CHAMPUS, located in Aurora, Colorado. Beneficiary claims world-wide, with the exception of Europe, are processed by "fiscal intermediaries" under contract with OCHAMPUS. The European operation is administered by a CHAMPUS office in Heidelberg, Germany.

Our goal remains to ensure that CHAMPUS serves as a powerful incentive in the recruitment and retention of a strong military force. This, of course, must be accomplished through the most efficient use of our resources. The CHAMPUS FY 1983 budget request, I believe, reflects an appropriate balance between these two goals.

Before discussing the 1983 budget, let's explore this difficult balance. You are probably aware that health coverage is the second most important factor--running only behind salary--in career decisions made by military personnel. A supplemental program to the military's direct medical care service--such as CHAMPUS--is undoubtedly one of the most cost-effective means of providing health coverage. The efficiency of a supplemental program becomes even more apparent in light of the flexibility needed for meaningful medical plans for any military mobilization.

In the past year, we have modestly enhanced CHAMPUS benefits to become more comparable to the burgeoning health insurance plans offered by the private sector. But an attractive array of benefits will achieve little, unless the service person has--and perceives he or she has--ready access to those benefits. So CHAMPUS has significantly improved administration, delivery and beneficiary education of the benefit package. Many of these enhancements will yield cost savings to both the beneficiary and the Government. But inevitably, some will increase the CHAMPUS budget needs. A portion of this increase will ultimately be offset by intensified activities in control of fraud and abuse and in testing alternative, more cost efficient benefit delivery systems.

Nevertheless, it is important to recognize that there is an inherent conflict built into our goals. As we do a better job of making our program accessible, use of CHAMPUS increases--along with our costs. Now place this in a national context of escalating health care costs, increasing public expectations of health coverage, rising unemployment, and a proliferation of medically valuable but expensive technology. The challenge before us is sizable.

Because of these factors and others I will discuss further, the FY 1983 budget estimate of $1,079.6 million is likely to fall short of the CHAMPUS requirements. Until we have collected additional data on our 1982 expenditures and have completed further analysis, I am not able to discuss specifics. But we are rigorously monitoring the situation.

We are finding that our costs this fiscal year are far exceeding our original estimate. For one thing, CHAMPUS is experiencing an increase in user population and a concomitant increase in claims. Our fiscal intermediaries have processed 19 percent more claims than last year at this time. This exceeds our growth rate projection for 1982 by 14 percent. And it is also considerably higher than the 1 to 3 percent growth in utilization being experienced by other major health care programs in the private sector.

The reasons behind this surge may well include intensified efforts by CHAMPUS and the services to educate beneficiaries of their entitlements. The current high unemployment rate has also undoubtedly forced many eligible beneficiaries away from private employee plans and back to CHAMPUS for primary coverage. And certainly, our progress in streamlining claims processing time and in enhancing the benefits package has drawn more beneficiaries into the CHAMPUS system.

Another factor likely to affect our FY 82 experience and therefore impact on our FY 82 budget request is the change in determining the CHAMPUS allowable charge approved by the Congress and implemented this year. The change in reimbursement methodology and the more frequent updating of allowable medical charges should help improve participation by providers. The change will also improve access and delivery of services to our beneficiaries. However, as the CHAMPUS allowable charges more accurately reflect current medical fees, CHAMPUS payments will increase and reflect more closely the rising national cost trends.

For all of these reasons, we conservatively project that the percentage of increase in FY 82 will probably continue into FY 83. But these concerns should not diminish appreciation of the positive trends in CHAMPUS fiscal operations. For one thing, we are optimistic that our administrative costs for FY 83 will continue at a remarkably low rate. We have requested only a 4.3 percent increase in FY 83 administrative costs. Even with this increase we will have reduced our overall administrative costs, when compared to the total program, from 6.7 percent in FY 1982 to 6.2 percent in FY 1983. We are proud that as CHAMPUS has grown in both scope and complexity, we have maintained an administrative cost rate that compares very favorably with an average of 7 to 8 percent rate for similar programs in the private sector. Our FY 1983 request in the administrative area, we feel, will be adequate.

We are also pleased with the cost savings aspects of our expanded utilization review. As we discussed in our last year's statement, we established the professional psychiatric and psychological case review system. In the past year, 17 percent of the inpatient cases under review were deemed inappropriate and benefits were terminated. Another indication of our success in this area is that several major insurance carriers have adopted our pioneering peer review system. We have also recently established an Office of Program Integrity to monitor utilization through prepayment and postpayment analysis of claims. This office is also investigating alleged cases of fraud and abuse and is taking action against providers or beneficiaries who are guilty of illegal activities.

Among the new benefits that will yield cost reductions for both beneficiaries and the Government are this Committee's authorization of nurse practitioners and, on an experimental basis, clinical social workers, as independent providers of care. CHAMPUS now shares the costs of surgery in ambulatory or outpatient settings at inpatient rates for dependents of active duty members. This will encourage use of the less expensive ambulatory services. Further new policy allowing home parenteral nutrition services will permit beneficiaries to be discharged from hospitals sooner.

We soon will be implementing additional changes in coverage that will provide us cost savings. The Joint Health Benefits Delivery Program will permit civilian physicians to render services in military facilities that are experiencing shortages in certain medical specialties. Under this program, professional reimbursement will be lower than current allowable charges and the costs of civilian hospital care will be saved. The purchase of durable medical equipment will soon be allowed by CHAMPUS when the cost of long-term leasing exceeds the purchase price.

The HMO Demonstration Project of "CHAMPUS CHOICE", authorized by this Committee 18 months ago, portends a redefinition of the very structure of the CHAMPUS. The potential for cost efficiency is enormous. CHAMPUS CHOICE has been operating in Portland, Oregon since September 1, 1981. Similar contracts are now being negotiated with HMOs in Houston and Minneapolis. Although our final results will not be available until 1986, we are confident that the prepaid health plan concept is a viable way to offer another option of quality care at lower costs to beneficiaries and the Government.

New advances in program management are also likely to increase CHAMPUS productivity and further enhance responsiveness to beneficaries. We are preparing to automate the CHAMPUS offices in Colorado to eliminate excess paperwork and to allow us on-line access to claims payment files we use in daily operations. By the end of the year, we expect to have a fully automated Finance and Accounting System. We have also been cooperating with the Defense Enrollment Eligibility Reporting System (DEERS), knowing that an enrollment system will not only reduce fraud and abuse in our system, but will also streamline our claims processing and allow better planning.

Management efficiencies have also been a fundamental reason for the comprehensive revision of the contract requirements for our fiscal intermediaries. Reducing turnaround time for claims payments remains a very high priority. The fiscal intermediaries are now required to conduct telephone development of incomplete claims as well as several beneficiary and provider relations activities. The success is already evident. In 1979 about 46 percent of our 3.4 million claims were processed within 21 days. From February to April of this year, we are showing nearly 75 percent of claims processed within 21 days. By late 1983, when the incentive aspects of the new contracts have been fully implemented, we anticipate even more visible improvement in processing time.

You can see that CHAMPUS is progressing at a good pace. We are aggressively pursuing innovative approaches to strengthen CHAMPUS as a military service benefit to be proud of. And we are doing this in a fiscally responsible way.

This concludes my statement. I would be happy to answer any questions you may have.

CIVILIAN HEALTH AND MEDICAL PROGRAM OF THE UNIFORMED SERVICES

Summary of Financial Requirements
(In Thousands of Dollars)

Exhibit 1

	FY 1981	FY 1982			FY 1983	
Type of Expenses	FY 1981 Actual	President's Budget	Adjustments	Revised Estimates	Increase/ Decrease	Budget Estimate
Civilian Personnel Costs	4,664	5,436	-205	5,231	+343	5,574
Travel & Transportation of Persons	446	705	-100	605	+127	732
Transportation of Things	48	50	--	50	+8	58
Rent, Communications, Utilities	611	1,667	-629	1,038	+169	1,207
Printing and Reproduction	611	3,806	--	3,806	+258	4,064
Other Purchased Services	845,351	924,624	+28,881	953,505	+114,011	1,067,516
Supplies and Materials	178	310	+3	313	+36	349
Equipment Purchases	89	56	--	56	+4	60
Total Obligations	851,998	936,654	+27,950	964,604	+114,956	1,079,560

CIVILIAN HEALTH AND MEDICAL PROGRAM OF THE UNIFORMED SERVICES

Summary of Personnel Requirements

Exhibit 2

	FY 1981	FY 1982			FY 1983
	FY 81 Actual	President's Budget	Adjustments	Revised Estimates	Budget Estimate
Year End Strength					
Civilian					
U.S. Direct Hire	184	196	---	196	196
Foreign National, Indirect Hire	16	14	---	14	14
Military	8	9	---	9	9
Totals	208	219	---	219	219
Average Employment					
Civilian					
U.S. Direct Hire	196	196	---	196	196
Foreign National, Indirect Hire	14	14	---	14	14
Military	6	9	---	9	9
Totals	216	219	---	219	219

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

PREPARED STATEMENT

Mr. Chairman, Members of the Committee, I greatly appreciate the opportunity to present the budget requests for the Uniformed Services University of the Health Sciences for Fiscal Year 1983.

I am pleased to inform the Committee that during the current year, another significant milestone in the School's mission of providing highly qualified medical officers for the military and Public Health Service will have been achieved. This May, the University will graduate its third class with the awarding of Doctor of Medicine degrees to 103 medical students. This compares with 66 and 29 in the second and first graduating classes, respectively. The size of this year's graduating class is significant because it satisfies the legislative requirement that the University graduate not less than 100 students annually.

The ability to rapidly establish a medical education program of recognized quality is due in large measure to strong, constant Congressional support. Speaking for myself, as well as for Mr. David Packard, who serves as Chairman of the University's Board of Regents, I wish to express special gratitude to this Committee for its continuing interest and confidence in this program and for the assistance which has been provided.

The University budget requests are commensurate with the growth in student enrollment. The request for Operation and Maintenance funds in FY 1983 is for $27,833,000. This increase of $1.9 million over the FY 1982 budget will be used primarily for inflationary increases and for personnel compensation and benefits to the additional faculty and staff employed to support the larger student load.

Approval of $1,285,000 in procurement funds is requested for the purpose of purchasing additional student laboratory and other teaching equipment, necessitated by increased class sizes, and by the need for improvement in departmental laboratory equipment and replacement of obsolete items.

The $1,800,000 requested in FY 1983 for Research, Development, Test and Evaluation (RDT&E) will permit the continuation of present programs and the establishment of a small number of new programs for improvement in military health care, infectious diseases and their control, combat casualty care, hazard protection, and health care research. All of the University's programs are reviewed regularly by the Office of the Under Secretary of Defense for Research and Engineering and coordinated with the Military Departments. Scientific merit is evaluated in relation to other research programs in and out of the Department of Defense. Reviews also eliminate the possibility of undesirable duplication.

The continuing academic accreditation of the University requires the maintenance of a strong research program. This program permits faculty members to remain current with the advances in scientific knowledge and to engage in productive research in their area of expertise. The program supports medical education by the development of a spirit of inquiry in the students, and fosters their effective harnessing of this spirit through the utilization of the scientific method.

To provide a viable research program, there must be a reliable source of funding. Civilian medical schools rely upon support from state and local governments and from corporate contributions for core research money. Because the Uniformed Services University does not have access to such state and local funds and does not wish to solicit from corporate sources due to the potential for conflict of interest, sole reliance is placed on Congressional funding to provide the "seed" money to initiate programs, and to maintain a minimum level of support.

The University's RDT&E program represents 5.8 percent of the 1983 budget, considerably lower than that of other high quality medical schools, all of which have major research commitments. However, this level of effort is consistent with our major goal, the development of a quality educational program in which the research effort is complementary to the educational mission. To maintain a quality faculty, especially one which remains concerned with the problems of military medicine, these RDT&E funds are essential. The programs supported by these funds are of military relevance and link the students and faculty directly with problems in military medicine.

New to the University budget is the Special Foreign Currency Program request for $784,000. These monies are to fund epidemiologic studies of infectious diseases in Pakistan and are to be paid from U. S. government holdings of Pakistani rupees designated as excess by the Office of Management and Budget. This undertaking would result in the identification and geographical mapping of infectious diseases of major public health and military importance. Such information is essential for military contingency planning and for development of disease prevention programs and would be immediately and directly applicable in public health and preventive medicine programs among the civilian and military populations of Pakistan. This project augments the DoD infectious disease research and teaching programs in an area of vital interest to the United States and can be accomplished without the use of limited RDT&E funds and without exacerbating the balance of payment situation.

Those of us associated with the Uniformed Services University are proud of past accomplishments and excited about the future. The graduation of the third class is most satisfying and significant because, quantitatively, it marks a year's increased growth in the contribution which the University is making in meeting the health care needs of our Nation's uniformed services; and qualitatively, these men and women will have been uniquely trained as military physicians.

I would be pleased to respond to any questions or comments from the Committee.

Thank you.

U. S. COURT OF MILITARY APPEALS

PREPARED STATEMENT OF HON. ROBINSON O. EVERETT
CHIEF JUDGE

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to present to you the Appropriation Request of the United States Court of Military Appeals for Fiscal Year 1983. This is my second opportunity to present such a request since I assumed office on April 16, 1980.

For Fiscal Year 1983 the Court is requesting $3,210,000, a funding level designed to maintain our current programs. This request is $603,000 greater than the FY1982 Appropriation of $2,607,000. Included in this net increase is $142,000 attributable entirely to inflation costs. The remaining $461,000 represents known increases that are essential to the operation of the Court. For instance, rental payments to GSA for leasing the Court facilities will increase by over $100,000 while maintenance costs for the new automated equipment used by the Court will increase by almost $250,000. The automated systems are absolutely essential to our maintaining a current docket and in fact have produced savings, which I will address later in my presentation.

The Court still has not reached it's projected staffing level of 49 and, consistent with the Administration's continuing efforts to minimise government expenditures, we will endeavor not to increase our staff to that level until it becomes absolutely essential because of substantial increase in our caseload.

In this regard, I should note here that we are continuing to experience a steadily increasing caseload. Most of the Court's cases come up on direct appeal from the Courts of Military Review of the various Armed Services. These intermediate appellate courts have similarly been experiencing substantial increases in caseload in the recent past. For example, the Navy-Marine Corps Court of Military Review experienced in Fiscal Year 1981 an increase of approximately 50% in the number of court-martial cases submitted for appellate review over the caseload filings in that court during the prior fiscal year. Similarly, although not to such a drastic extent, the Army Court of Military Review had an increase of approximately 14% in caseload filings during the same comparative fiscal year periods. The Air Force Court of Military Review likewise experienced an 11% increase in caseload filings during the same timeframe. During Fiscal Year 1981, our Court's overall case filings have increased 24% over the number of case filings for the prior fiscal year. As in the past, we expect that during Fiscal Year 1982 and Fiscal Year 1983 we will continue to receive at least some portion of the increasing numbers of cases being reviewed at the intermediate appellate court level.

One of the reasons why the Court has been able to handle the constantly growing rate of caseload filings without significant personnel increases is the integrated word processing and data processing computer system which became fully operational last year. Several months ago our Docket Room accomplished a complete transition from manual docketing procedures to a completely automated docketing system. Instead of seeking information in individual docket books, our staff now can obtain it at computer terminals located in work areas throughout our Courthouse. The greater accessibility of information provides time savings which translate into cost savings, since additional docket room personnel need not be hired and additional space for court records is not needed. Since the automated system requires a single disc pack costing about $500.00 in order to retain and store the caseload data for a 3-year period, a tangible 3-year cost savings of $14,000.00 should be realized by eliminating the purchase of six (6) dockets books each year, at a present cost of $800.00 per book. Furthermore, automation of caseflow data enables the Court to manage its docket more efficiently and may permit us to identify important trends that otherwise would go unnoticed.

One of the continuing responsibilities of the members of the Court is to travel to various local military communities throughout the world. We have viewed this responsibility as a necessary means of developing a better appreciation of some of the operational problems in the various Armed Services -- problems which must be taken into account if the Court is to be judicially responsive to the needs of the military community in administering the military justice system. For example, in the spring of 1981, I visited the Military Academy at West Point, New York; the Air Force Academy and Peterson Air Force Base in Colorado; Fort Sam Houston, Texas; Camp Lejeune, North Carolina; and the Langley Air Force Base, Virginia. That fall I traveled to the Army JAG School at Charlottesvlle, Virginia, and to Homestead Air Force Base, Florida; and just recently, I visited Fort Bragg, North Carolina. Judge Cook visited Fort Sam Houston, Texas, and Maxwell Air Force Base, Alabama, in early 1981, and Fort Lewis, Washington, and Fort Sill, Oklahoma, during the summer of 1981. Judge Fletcher visited several military installations in the Far East in the spring of 1981.

In addition to these visits, the members of the Court consider it important to participate in conferences, seminars, and similar projects to improve the professional legal education of military lawyers and to make service personnel and the general public aware of the safeguards provided by the Uniform Code of Military Justice and the Court's decisions interpreting the Code.

Another responsibility which the members of the Court view quite seriously is imposed under Article 67(g) of the Code, which directs that the Judges of the Court, along with the Judge Advocates General, meet annually to inform the Congress of the status of military justice and to make recommendations relating to amendments to the Code. In this regard, I might note that all of the Judges of the Court meet more frequently than annually with the Judge Advocates General to fulfill this codal responsibility. As a result of such meetings, the Court's members appeared before a subcommittee of the House Armed Services Committee in October of last year in support of certain amendments to the Code, which were subsequently enacted into law. We have more recently met with the Judge Advocates General to review a series of proposed amendments to the Code which the Department of Defense plans to forward to the Congress for the improvement of the military justice system. Of course, our visits to military installations help us become aware of specific needs which should be met by legislation to be proposed to Congress under Article 67(g).

In last year's presentation of the Court's Appropriation Request I made reference to a major task of eliminating a case backlog which resulted from a prior seven month period during which there were only two Judges on the Court. The substantial accomplishment of this task is reflected in the fact that the Court's issuance of full written opinions, as opposed to a brief summary disposition by order, has increased by 65% during Fiscal Year 1981 as compared with the number of opinions issued during the prior fiscal year. This percentage figure climbs to 82% when the more current calendar years of 1980 and 1981 are compared. In addition, the history of our most recently disposed of cases shows that a number of the Court's opinions were issued within 12 weeks after oral argument was heard. Although we have experienced a 24% increase in caseload filings during Fiscal Year 1981, we have been able, by using our integrated word processing and data processing computer system to its maximum potential, to avoid personnel increases in our effort to substantially reduce an existing backlog of undecided cases.

I again wish to express my appreciation for this opportunity to present the Court's Appropriation Request; and I am hopeful that my comments have provided you some insight into the problems facing the Court. I have also provided for your information the Court's Fiscal Year 1981 statistics, which should be instructive as to the progress which we have achieved. I shall be pleased to answer any other questions the Committee might have.

USCMA STATISTICAL REPORT

Fiscal Year 1981

CUMULATIVE SUMMARY

CUMULATIVE BEGINNING PENDING	
Master Docket	387
Petition Docket	320
Miscellaneous Docket	3
TOTAL	710
CUMULATIVE FILINGS	
Master Docket	
Certificates filed	9
Reconsiderations granted	3
Petition Docket	
Petitions for grant filed	2173
Cross-petitions for grant filed	6
Petitions for new trial filed	1
Miscellaneous Docket	59
TOTAL	2251
CUMULATIVE TERMINATIONS	
Master Docket	354
Petition Docket	2073
Miscellaneous Docket	55
TOTAL	2482
CUMULATIVE END PENDING	
Master Docket	196
Petition Docket	427
Miscellaneous Docket	7
TOTAL	630

OPINION SUMMARY

CATEGORY	SIGNED	PER CURIAM	MEM/ORDER	TOTAL
Master Docket	93	33	228	354
Petition Docket	0	0	2073	2073
Miscellaneous Docket	3	0	52	55
TOTAL	96	33	2353	2482

FILINGS (MASTER DOCKET)

Appeals filed	0
Certifications filed	9
Reconsideration granted	3
Petitions granted (from Petition Docket)	151
TOTAL	163

TERMINATIONS (MASTER DOCKET)

Findings & sentence affirmed	287		
Reversed in whole or in part	46	Signed	93
Granted petitions vacated	4	Per curiam	33
Other disposition directed	17	Mem/order	228
TOTAL	354	TOTAL	354

PENDING (MASTER DOCKET)

Assigned Opinions pending	24
Judges' conference pending	1
Oral argument pending	34
Preargument conference pending	17
Calendar committee pending	100
Final briefs pending	20
TOTAL	196

FILINGS (PETITION DOCKET)

Petitions for grant of review filed	2173
Petitions for grant/new trial filed	1
Cross-petitions for grant filed	6
TOTAL	2180

TERMINATIONS (PETITION DOCKET)

Petitions for grant dismissed	33		
Petitions for grant denied	1871		
Petitions for grant granted	151		
Petitions for grant remanded	9	Signed	
Petitions for grant withdrawn	9	Per curiam	
		Mem/order	2073
TOTAL	2073	TOTAL	2073

PENDING (PETITION DOCKET)

Petition briefs pending	186
Staff attorney action pending	185
Court action pending	56
TOTAL	427

FILINGS (MISCELLANEOUS DOCKET)

Writs of errors coram nobis sought	1
Writs of habeas corpus sought	30
Writs of mandamus/prohibition sought	14
Other extraordinary relief sought	8
Writs appeals sought	6
TOTAL	59

TERMINATIONS (MISCELLANEOUS DOCKET)

Petitions withdrawn	3		
Petitions remanded	0		
Petitions granted	2	Signed	3
Petitions denied	41	Per Curiam	0
Petitions dismissed	9	Mem/order	52
TOTAL	55		55

PENDING (MISCELLANEOUS DOCKET)

Briefs pending	0
Action by Writs Counsel pending	0
Show cause action by Court pending	0
Show cause response pending	3
Other final action pending	4
TOTAL	7

RECONSIDERATIONS & REHEARINGS

CATEGORY	FILINGS	PENDING	DISPOSITIONS		
			Granted	Rejected	TOTAL
Master Docket	2	1	0	1	1
Petition Docket	7	2	0	5	5
Miscellaneous Docket	1	0	0	1	1
TOTAL	10	3	0	7	7

MOTIONS ACTIVITY

CATEGORY	BEGIN PENDING	FILINGS	END PENDING	DISPOSITIONS		
				Granted	Rejected	TOTAL
All motions	36	823	69	686	104	790

CLAIMS, DEFENSE

PREPARED STATEMENT OF L. PAUL DUBE

DIRECTOR FOR OPERATIONS
OFFICE OF DEPUTY ASSISTANT SECRETARY OF DEFENSE (PROGRAM/BUDGET)
OFFICE OF ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before your Committee today to discuss the estimated fiscal year 1983 requirements for the appropriation "Claims Defense." This appropriation, as prescribed by law, provides the funds required for payments of non-contractual claims against the Department of Defense.

For fiscal year 1983 we are estimating a requirement of $172.5 million. The Congress appropriated $155.7 million for FY 1982. Congressional reductions in FY 1980, FY 1981 and FY 1982 have restricted our ability to fully fund our requirements in a timely manner. The continued rapid growth in both the cost and number of claims makes it essential that our current FY 1983 request be approved.

As you are aware, Claims, Defense is largely an uncontrollable appropriation and it is very difficult to develop precise estimates. Estimates are based on historical trends. The majority of the claims are personnel claims which arise from the loss or damage of personnel property of military employees during shipment, or from acts of nature. Others include tort claims which arise from personal injury or personel property damage caused by negligence of an employee of DoD while acting in the scope of his or her employment. Maneuver damage claims are included in this tort claims category. Reimbursements made in a particular year do not equate precisely to the damages caused in that year. There is a time lag between the cause of the damage and the filing, adjudication and settlement of the claim arising from it. For NATO SOFA claims, there is a further link in the chain. The foreign government agency which has processed and paid a claim submits a reimbursement request to the U.S. Army Claims Service, Europe which then reimburses to the foreign government, the United States share of the costs under Article VIII of the NATO SOFA. Therefore, claims can be neither programed in advance nor precisely controlled from year to year. They are adjudicated by properly constituted review authorities and to the extent they are determined payable, they legally must be paid.

While we can defer nominal amounts of claims from one year to another in order to keep within our obligational authority, it is clear that we are merely pushing our financial problems forward from year to year. Further, it is only equitable that we pay the claim as promptly as possible once it has been adjudicated.

Over the past several years, the Congress has taken exception to the amount in the budget for payment of foreign claims, particularly those in Germany. This reflects a desire that the German Government should pay a larger share of the claims. We believe that the question is much broader than which country pays how much of what claim. The current arrangement is part of the Status of Forces Agreement (SOFA). We cannot change the claims provision of the SOFA without opening up negotiations on the entire SOFA. Unless and until the SOFA is changed, we believe that the United States Government has an obligation to pay these claims when they are properly adjudicated and we believe they are being properly adjudicated.

As I stated earlier, this account is increasing significantly over the budget period as both the cost of claims and the number of claims increase dramatically. A major portion of this increase has been in maneuver damage NATO SOFA reimbursement to the Federal Republic of Germany. There appears to be at least two important reasons for this, (1) increased military activity and (2) adverse economic conditions.

I would like to briefly discuss these points in order to provide a better understanding of the nature of the increased funding requirements. After the end of the war in Viet Nam, there was a replenishing and enhancing of U.S. military presence in Western Europe. The percentage of forces who were combat troops also increased because of the Nunn Amendment. Further, the Army became more mechanized. Our tanks and other tracked vehicles, which are largely responsible for maneuver damages, were also being upgraded and replaced with newer, faster and heavier models.

Because of the larger, more modern force, there was an increased need to conduct maneuvers outside established training areas. These military factors alone would have caused a substantial increase in maneuver damages and accordingly an increase in U.S. reimbursements to Germany. However, over the past few years there were also two major economic factors which combined to exacerbate the situation. The first was the rise in the value of the Deutsche Mark in relation to the dollar. I realize the dollar has been performing better in the past several months but must point out the effect of the dollar's decline in the past few years because it is in this period that the claims reimbursement increase seemed so dramatic. The other factor is inflation. Although Germany suffered less from inflation than the U.S., general inflation in Germany exceeded 13% and in the construction field over 20% during the past few years. This latter figure is particularly significant because about half of the U.S. reimbursement is for road damage.

In summary, the estimate of $172.5 million in FY 1983 represents in our judgment a reasonable projection of the requirements for all the types of non-contractual claims against the Department of Defense. As you can appreciate, delaying payments due to a lack of funds results in a hardship to those persons whose claims happen to be adjudicated in the latter part of the fiscal year. These delays and the resultant ill will create a considerable problem for the military services and only worsens the military member's view of how he or she is treated as a member of the military establishment.

This completes my prepared statement. I will be happy at this time to answer any questions that the Chairman or members of the Committee may have.

RETIRED PAY, DEFENSE

PREPARED STATEMENT

The appropriation requested is a consolidation of the estimates of the military services for retired pay of military personnel on the retired lists of the Army, Navy, Marine Corps and Air Force, retainer pay for members of the Inactive Fleet Reserve of the Navy and Marine Corps, and payments to retired military personnel under the Retired Serviceman's Family Protection Plan (RSFPP) and the Survivor Benefit Plan (SBP).

The basic appropriation request for FY 1983 is $16,510.8 million, compared with $14,938.3 million initially appropriated plus supplemental funds of $97.7 million for a total of $15,036.0 million in FY 1982. The amount requested for FY 1983 will provide for payments to an average of 1.4 million retirees and their survivors, an increase of 40,800 over the estimate for FY 1982.

The proposed supplemental appropriation for FY 1982 is required primarily to provide for the additional retirement costs resulting from changes in cost-of-living increaeses and the October 1 pay raise for military personnel retiring during the year.

The appropriation request for FY 1983 is $1,474.8 greater than the revised FY 1982 request. The details of the increased costs are summarzied below:

	($ Millions)		
	FY 1982	FY 1983	FY 1982-FY 1983
Estimated Cost at End of FY 1981 Rates	14,351.2	14,753.9	+402.7
March 1, 1982 CPI (8.9%)	+742.1	+1,272.2	+530.1
March 1, 1983 CPI (6.6%)	-	+615.5	+615.5
VA Compensation Adjustment	-34.3	-34.3	-
Survivors' Benefits (Open Season)	-75.0	-109.0	-34.0
Military Pay Increase	+52.0	+101.0	+49.0
Total Current Law	15,036.0	16,599.3	+1,563.3
Proposed Legislation	-	-88.5	-88.5
President's Budget	15,036.0	16,510.8	+1,474.8

VA Compensation Adjustment

Military retirees who qualify for a VA disability may elect to receive a disability payment from the VA and have their military retired pay reduced by a like amount. It is to the advantage of the retiree to do this since there is a tax advantage to the monthly payment received from the VA. Consequently, when VA disability payments are increased for inflation, there is a corresponding decrease to DoD retired pay. As of October 1, 1981, individuals who receive a disability payment from the VA will get an increase of 11.2 percent. This action will reduce the cost of retired pay by $34.3 million in both FY 1982 and FY 1983.

Survivors' Benefits (Open Season)

Recent legislation provides new SBP benefits and permits new elections of the SBP option during an open enrollment period. Since election of the survivors' benefit option to military retired pay is now more attractive, a number of individuals who had not previously selected this program will do so during the open season. In addition, a number of individuals who had previously elected the SBP will increase the amount of SBP coverage during the open season. The result of these actions will be a reduction to the cost of military retired pay in the near term and increased expenditures in the future.

It is estimated that the cost of retired pay will be reduced by $75 million in FY 1982 and $109 million in FY 1983. The actual savings realized will be dependent upon the number of new participants electing coverage and the amount of SBP coverage elected as well as the increase to SBP coverage elected by existing participants. The assumptions underlying the savings included in the budget are as follows:

	Officer	Enlisted
Average monthly benefit increase elected by current participants	$34.00	$13.00
Average monthly benefit increase elected by new participants	$562.00	$270.00
Percent of current nonparticipants who will elect to participate	22%	20%

Military Pay Increase

The Uniformed Services Pay Act of 1981 included a 14.3 percent pay increase for military personnel. The budget includes $52 million in FY 1982 and $101 million in FY 1983 to reflect the impact of the pay increase on military retired pay. Following our normal practice, the impact in FY 1983 of the proposed 8 percent military pay increase scheduled for October 1, 1982, however, has not been included in the FY 1983 estimates. The impact of this pay raise on Retired Pay, Defense will be evaluated during formulation of the FY 1984 Budget.

Proposed Legislation

Current Law. Under current law --

o military retirement benefits are rounded to the nearest whole cent.

o military personnel are provided an annuity based on the current pay scale, or on the preceding pay scale plus intervening CPI adjustments (the "look-back" provision), whichever is greater.

o military retired pay is adjusted annually by the increase in CPI.

Because the CPI exceeded military pay raises in recent years, 60 percent of the military retired population receive higher annuities than they would receive if retiring under today's pay scale at the same grade and length of service. The difference is as much as 21 percent for retirees who retired under the 1973 pay scales.

New Legislation. The provisions of the new legislation and funding impact are as follows:

o round all benefit levels down to the next lower dollar in calculating annuities (-$4.5 million in FY 1983).

o eliminate the "look-back" provision from the law. This is not to be confused with the Tower Amendment, which would be retained. (No savings in FY 1983 under current economic and pay assumptions.)

o provide no CPI increases for retired members whose annuities are 120 percent or more than a similar member retiring today receives. Provide 75 percent of the CPI increase for members whose annuities range up to 119 percent of current annuities (-$84 million in FY 1983).

o hold future increases in military retirement to the military pay increase or CPI change, whichever is lower. (No savings in FY 1983 under current economic and pay assumptions.)

SUMMARY

The amounts included for each of the categories of retired pay are based on computations of averages of the rates payable or expected to be payable applied to the best available projections of the number of personnel to be carried on the rolls in Fiscal Years 1982 and 1983.

Payments under this appopriation are required by law and any funds not required revert to the Treasury at the end of the fiscal year.

MAJOR CATEGORIES OF PERSONNEL

General

There are five major categories of personnel who will receive payments from this appropriation.

Nondisability

The nondisability category includes personnel who are retired for age or length of service. (Title III personnel who gain eligibility on the basis of points credited and whose retired pay is deferred to age 60 are also in this category.)

It is estimated that $13,629.6 million or 82.5 percent of the total appropriation request will be required to provide for an average of 1,097,710 retirees in the nondisability category in FY 1983. This is an increase of $1,260 million and 35,377 retirees over FY 1982.

Temporary Disability

The temporary disability category is an interim classification for disabled personnel where there is some doubt as to the degree or permanence of their disability.

It is estimated that $59.8 million or .4 percent of the total appropriation request will be required to provide for an average of 8,338 temporarily disabled retired military personnel in FY 1983. This is an increase of $5 million and a decrease of 415 retirees over FY 1982.

Permanent Disability

The permanent disability category is composed of military personnel whose disability has been definitely determined to be permanent. Persons may be placed on the permanent disability rolls immediately following the termination of their active duty or by transfer from the temporary disability rolls.

It is estimated that $1,386.8 million or 8.4 percent of the total appropriation request will be required in FY 1983 for an average of 134,952 permanently disabled retired military personnel. This is an increase of $72 million and a decrease of 1,225 retirees over FY 1982.

Fleet Reserve

The Fleet Reserve is composed of Navy and Marine Corps enlisted personnel having 20 but less than 30 years of service who elect to transfer from active duty to the Fleet Reserve. By law, upon completion of 30 years of combined active service and service in the Fleet Reserve or upon being found physically unfit for further military service, such personnel are transferred to the regular retired rolls.

It is estimated that $932.0 million or 5.7 percent of the appropriation request will be required in FY 1983 to provide for an average of 94,577 Fleet Reservists. This is an increase of $41 million and a decrease of 2,467 retirees over FY 1982.

Survivors' Benefits

The survivors' benefits category includes those survivors of active duty and retired military personnel who are entitled to payments under this appropriation.

It is estimated that $502.6 million or 3.0 percent of the total appropriation request will be required to provide for an average of 88,723 survivor annuitants in FY 1983. This is an increase of $96 million and 9,530 survivors over FY 1982.

BUDGET AUTHORITY, TOTAL OBLIGATIONS, UNOBLIGATED BALANCE AND AVERAGE NUMBER OF FISCAL YEAR
(In Thousands of Dollars)

Fiscal Year	Budget Authority	Total Obligations	Unobligated Balance	Average Number 5/
1952	345,000	330,598	14,402	137,785
1953	357,000	356,385	615	147,216
1954	387,000	386,298	702	162,305
1955	423,500	422,102	1,398	174,012
1956	495,000	478,932	16,068	185,754
1957	515,000	510,784	4,216	192,209
1958	567,000	560,962	6,038	208,570
1959	640,000	634,542	5,458	222,545
1960	715,000	692,922	22,078	242,904
1961	789,500	787,806	1,694	275,914
1962	920,000	895,854	24,146	313,436
1963	1,029,000 1/	1,014,755	10,925	358,830
1964	1,228,000	1,211,215	16,785	410,853
1965	1,399,000	1,385,578	13,422	462,463
1966	1,600,000	1,592,352	7,648	508,566
1967	1,839,000	1,831,159	7,841	564,280
1968	2,095,000	2,093,478	1,522	624,496
1969	2,450,000	2,422,941	7,059	691,688
1970	2,859,000 2/	2,853,234	4,766	750,144
1971	3,391,032	3,388,999	2,033	806,139
1972	3,921,446 3/	3,889,115	12,331	867,190
1973	4,441,684	4,392,218	49,466	923,788
1974	5,150,700	5,136,897	13,803	983,788
1975	6,250,900	6,238,511	12,389	1,049,553
1976	7,325,600	7,300,052	25,548	1,109,357
19TQ	1,968,248 4/	1,946,132	22,116	1,144,717
1977	8,238,100	8,218,698	19,402	1,175,019
1978	9,179,600	9,173,164	6,436	1,219,844
1979	10,283,000	10,282,049	951	1,262,951
1980	11,964,700	11,919,617	45,083	1,308,011
1981	13,840,000	13,724,427	115,573 6/	1,345,907
1982 7/	15,036,000	15,036,000	-	1,383,500
1983 7/	16,510,800	16,510,800	-	1,424,300

1/ $3.3 million transferred to "Claims, Defense."
2/ $1.0 million transferred to "Operation and Maintenance, Defense Agencies."
3/ $20.0 million transferred to "Operation and Maintenance, Air Force."
4/ Includes $1,942,700 appropriated plus $25,548 apportioned in FY 1976 but unobligated on June 30, 1976, which is automatically apportioned for use during FY 19TQ.
5/ Includes those receiving Survivors' Benefits.
6/ Includes $67 million related to elimination of September 1981 CPI.
7/ FY 1981 and FY 1982 data are estimates.

SUBCOMMITTEE RECESS

Senator STEVENS. This concludes the hearing. We will be in recess subject to the call of the Chair.

[Whereupon, at 12:15 p.m., Wednesday, June 23, the subcommittee was recessed, to reconvene Thursday, June 24.]

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(*See also* Fighter/attack forces under "Tactical Aircraft Issues")

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